

Access DB# 99581

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Wayne Langel Examiner #: 60603 Date: 7-29-03  
Art Unit: 1754 Phone Number 308-0248 Serial Number: 09/882519  
Mail Box and Bldg/Room Location: CP3-9D17 Results Format Preferred (circle) PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Intrinsically safe oxidation process  
Inventors (please provide full names): Peter Pujado

Earliest Priority Filing Date: 6-15-01

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

*please search claims 1-25, as attached hereto.*

## STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher: <u>Jon Cane</u>	NA Sequence (#) _____	STN <u>\$</u>
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) _____	Questel/Orbit _____
Date Searcher Picked Up: <u>7/28/03</u>	Bibliographic <u>/</u>	Dr.Link _____
Date Completed: <u>7/28/03</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>120</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>120</u>	Other _____	Other (specify) _____

=> file hca

FILE 'HCA' ENTERED AT 11:53:16 ON 28 JUL 2003

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

COPYRIGHT (C) 2003 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storing of this information, without the prior written consent of CAS, is strictly prohibited.

FILE COVERS 1907 - 24 Jul 2003 VOL 139 ISS 5

FILE LAST UPDATED: 24 Jul 2003 (20030724/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d his

(FILE 'HOME' ENTERED AT 10:28:37 ON 28 JUL 2003)

FILE 'REGISTRY' ENTERED AT 10:28:54 ON 28 JUL 2003

E 1333-74-0/RN

L1 1 S E3

L2 1 S HYDROGEN PEROXIDE/CN

FILE 'HCA' ENTERED AT 10:29:47 ON 28 JUL 2003

L3 267237 S L1

L4 74134 S L2

L5 861478 S L3 OR HYDROGEN# OR H2

L6 164548 S L4 OR H2O2 OR HYDROGEN#(N) PEROXIDE#

L7 33351 S FLUOROCARBON? OR CHLOROCARBON? OR BROMOCARBON? OR CF4 OR C2F6

L8 8608 S HALOGEN?(2N)HYDROCARBON##

FILE 'LCA' ENTERED AT 10:32:45 ON 28 JUL 2003

L9 1379 S POLYOLEFIN? OR POLYETHYLENE# OR POLYETHENE# OR PE OR POLYPROP

L10 4716 S AU OR GOLD# OR AG OR SILVER# OR PT OR PLATINUM# OR PD OR PALL

L11 3790 S CATALY? OR ACTIVATOR? OR ACCELERANT? OR ENHANCER? OR ACCELE

L12 63 S FEEDSTREAM? OR FEEDSTOCK? OR REACT?(2N)(STREAM?)

L13 788 S DEHYDROGENAT? OR DE(W)HYDROGEN? OR CRACK? OR HYDROCRACK?

L14 566 S (ETHYLENE# OR PROPYLENE# OR BUTYLENE#)(2N)OXIDE? OR EPOXIDE?

L15 6 S CHLOROFLUOROCARBON## OR FLUOROCHLOROCARBON## OR HYDROCHLOROFL

L16 21 S PERFLUOROCARB? OR FLUOROCHEM? OR PERFLUOROCHEM? OR HYDROFLUOR

L17 2 S PERFLUORO(N)(PENTANE# OR HEXANE# OR HEPTANE# OR OCTANE#) OR P

L18 3310 S OXIDAT? OR OXIDIZ? OR OXIDIS?

L19 3548 S AIR# OR O2 OR OXYGEN#

FILE 'HCA' ENTERED AT 10:54:08 ON 28 JUL 2003

L20 88034 S L5 AND L6

L21 1580 S L20 AND L9

L22 126 S L21 AND L14

L23 1 S L22 AND L13

L24 0 S L22 AND L12

L25 1797 S L1 AND L2  
L26 33 S L25 AND L14  
L27 5 S L26 AND (L12 OR L13)  
L28 2437 S L19 AND L12  
L29 56238 S L7 OR L8 OR L15 OR L16 OR L17  
L30 18 S L28 AND L29  
L31 8 S L30 AND L11  
L32 3 S L31 AND L10  
L33 18 S L30 AND (L12 OR L13)  
L34 2783 S UOP?/PA  
L35 2 S L26 AND L34  
L36 1 S L30 AND L34  
L37 0 S L22 AND L34  
L38 18839 S EPOXIDATION/IT  
L39 182232 S HYDROCARBONS/IT  
L40 31142 S L19 AND FEED?  
L41 1332 S L40 AND L13  
L42 253 S L41 AND (L5 OR L6)  
L43 3 S L42 AND L9  
L44 56 S L42 AND L10  
L45 51 S L44 AND L11  
L46 0 S L45 AND L29  
L47 11 S L45 AND L39  
L48 0 S L47 AND L38  
L49 23 S L23 OR L27 OR L32 OR L35 OR L36 OR L43 OR L47  
L50 11 S L49 AND STREAM?  
L51 23 S L49 OR L50  
L52 436613 S 51/SC,SX  
L53 11 S L51 AND L52  
L54 23 S L51 OR L53

FILE 'ENERGY, CEN, ENCOMPPAT2, TULSA' ENTERED AT 11:11:27 ON 28 JUL 2003

L55 529549 S H2 OR HYDROGEN#  
L56 11350 S (HYDROGEN OR H2) (N) PEROXIDE# OR H2O2  
L57 10395 S L55 AND L56  
L58 320 S L57 AND L29  
L59 134 S L58 AND L11  
L60 39 S L59 AND L10  
L61 4 S L60 AND L13  
L62 3 S L60 AND L14  
SET MSTEPS ON  
L63 1 FILE ENERGY  
L64 3 FILE CEN  
L65 2 FILE ENCOMPPAT2  
L66 0 FILE TULSA  
TOTAL FOR ALL FILES  
L67 6 S L61 OR L62  
SET MSTEPS OFF

FILE 'CEN' ENTERED AT 11:17:35 ON 28 JUL 2003

E 400201/CC  
E 400?/CC  
E B1210/CC

FILE 'ENERGY' ENTERED AT 11:21:26 ON 28 JUL 2003

E B1210/CC  
E 400201/CC  
E DEHYDROGENAT+BT

L68 417570 S L55  
L69 7435 S L56

L70 6524 S L68 AND L69  
L71 198 S L70 AND L29  
L72 58 S L71 AND L11  
L73 34 S L72 AND L18  
L74 0 S L73 AND L12  
L75 0 S L73 AND L13  
L76 54735 S REFIN?  
L77 0 S L73 AND L76  
L78 1087 S UOP?/CS  
L79 1 S L70 AND L78  
L80 433 S L78 AND (L18 OR L19)  
L81 2 S L80 AND L29  
L82 328 S L80 AND L11  
L83 0 S L82 AND L14  
L84 0 S L82 AND EPOX?  
L85 94 S L82 AND L10  
L86 0 S L85 AND L56  
L87 0 S L85 AND PEROX?  
L88 1 S L82 AND PEROX?  
L89 4 S L63 OR L79 OR L81 OR L88  
L90 1 S L85 AND L9  
L91 4 S L89 OR L90

FILE 'ENCOMPPAT2' ENTERED AT 11:34:32 ON 28 JUL 2003

L92 3316 S L55 AND L56  
L93 113 S L92 AND L9  
L94 2 S L93 AND L29  
L95 54 S L93 AND L11  
L96 9 S L95 AND L10  
L97 11 S L94 OR L96  
L98 0 S L97 AND L13  
L99 1 S L95 AND L13  
L100 1 S L93 AND L13  
L101 12 S L94 OR L96 OR L100  
L102 12 S L101 AND PEROX?  
L103 3578 S EPOX?/TI  
L104 15417 S OLEFIN?/TI  
L105 616 S L103 AND L104  
L106 2442 S UOP?/PA  
L107 6 S L105 AND L106  
L108 499 S L105 AND L11  
L109 12 S L108 AND L29  
L110 18 S L107 OR L109

FILE 'ENERGY' ENTERED AT 11:42:55 ON 28 JUL 2003

L111 2113 S EPOX?/TI  
L112 1758 S OLEFIN?/TI  
L113 44 S L111 AND L112  
L114 2 S L113 AND L10

FILE 'CEN' ENTERED AT 11:44:19 ON 28 JUL 2003

L115 25 S L103  
L116 64 S L104  
L117 1 S L115 AND L116

FILE 'TULSA' ENTERED AT 11:44:48 ON 28 JUL 2003

L118 341 S L103  
L119 120 S L104  
L120 0 S L118 AND L119  
L121 573 S L12



L122 13876 S L13  
L123 58 S L121 AND L122  
L124 19 S L123 AND L11  
L125 2 S L124 AND L10  
L126 0 S L124 AND L29

FILE 'JAPIO, WPIX' ENTERED AT 11:47:52 ON 28 JUL 2003

L127 70541 S L111  
L128 46547 S L112  
L129 1321 S L127 AND L128  
L130 611 S L129 AND L11  
L131 15 S L130 AND L29  
L132 5 S L131 AND (HYDROGEN# OR H2)  
L133 6 S L131 AND (H2O2 OR PEROXID? OR HYDROGEN#(N) PEROX?)  
L134 7 S L132 OR L133  
L135 15 S L130 AND L12  
L136 0 S L135 AND L13  
L137 6 S L130 AND L13  
L138 28 S L134 OR L135 OR L137

FILE 'STNGUIDE' ENTERED AT 11:52:26 ON 28 JUL 2003

FILE 'HCA' ENTERED AT 11:53:16 ON 28 JUL 2003

=> d L54 1-23 ti

L54 ANSWER 1 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Process and catalysts for an integrated hydrogen peroxide production for use in organic-compound oxidations

L54 ANSWER 2 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Catalytic direct production of hydrogen peroxide from hydrogen and oxygen feeds

L54 ANSWER 3 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Preparation of crystalline zeolite SSZ-55 using quaternary organic amines as a template and its use as a **catalyst** for the conversion of hydrocarbons

L54 ANSWER 4 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI **Catalysts** and sulfur-containing promoters for alkane oxidative **dehydrogenation** processes in the manufacture of vinyl acetate

L54 ANSWER 5 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Hybrid fuel-cell electric-combustion power system using complete pyrolysis

L54 ANSWER 6 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Process for the production of olefins from hydrocarbons using alternative or additional sources of heat to drive the **cracking** step of the auto-thermal **cracking** process

L54 ANSWER 7 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Method and **catalysts** for the **dehydrogenation** of hydrocarbons with equilibrium-shifting oxidation of the byproduct **hydrogen** for increased unsaturated product yield

L54 ANSWER 8 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Molecular sieve-based catalyst and process for the selective hydroisomerization of long straight chain and/or branched chain paraffins using this catalyst

- L54 ANSWER 9 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Hydrotreating an organic **feedstock** to removal halogenated components
- L54 ANSWER 10 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Process for producing **propylene oxide** from a **feedstream** comprising hydrogen and a carbon oxide
- L54 ANSWER 11 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Integrated process for the production of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream**
- L54 ANSWER 12 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI **Hydrocracking** and Hydroisomerization of Long-Chain Alkanes and **Polyolefins** over Metal-Promoted Anion-Modified Zirconium Oxides
- L54 ANSWER 13 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Compositions comprising a substrate coated with a mesoporous growth-enhancing layer and a polycrystalline zeolite layer, manufacture of the compositions, and **catalytic** and separation processes using the compositions
- L54 ANSWER 14 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Compositions comprising a substrate and a polycrystalline zeolite layer, manufacture of the compositions, and separation of hydrocarbonaceous **feedstocks** and **catalyzing** chemical reactions with the coated substrates
- L54 ANSWER 15 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI A review of advanced recycling technology
- L54 ANSWER 16 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Novel regeneration method of **Pt/KL** zeolite **catalyst** for light naphtha reforming
- L54 ANSWER 17 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Gas-phase oxidation of propylene by hydrogen peroxide
- L54 ANSWER 18 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Process for **dehydrogenation** of alkylaromatic hydrocarbons
- L54 ANSWER 19 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI **Oxygen** addition to oxidative reheat zone in hydrocarbon **dehydrogenation**
- L54 ANSWER 20 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Hydrocarbon isomerization **catalysts**
- L54 ANSWER 21 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Manufacture of aromatic hydrocarbons
- L54 ANSWER 22 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Hydrocarbon conversions in the presence of used and reactivated **platinum** reforming **catalysts**
- L54 ANSWER 23 OF 23 HCA COPYRIGHT 2003 ACS on STN  
TI Hydrocarbon resin dispersions

=> d L54 cbib abs hitind hitrn

L54 ANSWER 1 OF 23 HCA COPYRIGHT 2003 ACS on STN

138:56396 Process and catalysts for an integrated hydrogen peroxide production for use in organic-compound oxidations. Zhou, Bing; Rueter, Michael (Hydrocarbon Technologies, Inc., USA). U.S. US 6500969 B1 20021231, 10 pp., Cont.-in-part of U. S. Ser. No. 733,154. (English). CODEN: USXXAM. APPLICATION: US 2001-14068 20011211. PRIORITY: US 2000-733154 20001208.

AB A process for producing oxidized org. chem. products (e.g., **propylene oxide**) from various org. chem. **feedstocks** (e.g., propylene) utilizing as the oxidant hydrogen peroxide which is produced by noble metal nanocatalysis (e.g., Pd/C with titanium silicalite) with high selectivity at low hydrogen concns., from O<sub>2</sub> and H<sub>2</sub>, is described. The oxidn. process step can optionally be carried out in situ concurrent with the prodn. of hydrogen peroxide or in a two-stage process. In the two-stage process, the hydrogen peroxide intermediate is directly produced by noble metal nanocatalysis from hydrogen and oxygen feeds plus a suitable solvent (e.g., methanol) in a first catalytic reaction step. An org. chem. **feedstock** and the hydrogen peroxide intermediate and solvent soln. are fed into a second catalytic reactor to produce an oxidized org. chem. product; process flow diagrams are presented.

IC ICM C07D301-12

ICS C07D301-06

NCL 549531000; 549518000; 549523000

CC 35-2 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 27, 48, 67

ST **propylene oxide** manuf propene epoxidn noble metal nanocatalyst; oxidn org substrate hydrogen peroxide generation noble metal nanocatalyst; methyloxirane manuf hydrogen peroxide generation noble metal nanocatalyst

IT Amine oxides

#### Epoxides

Phenols, preparation

Sulfoxides

RL: EPR (Engineering process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)

(process and catalysts for an integrated hydrogen peroxide prodn. for use in org.-compd. oxidns. such as the manuf. of)

IT **7722-84-1P**, Hydrogen peroxide, preparation

RL: EPR (Engineering process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)

(process and catalysts for an integrated hydrogen peroxide prodn. for use in org.-compd. oxidns. using)

IT **1333-74-0**, Hydrogen, reactions 7782-44-7, Oxygen, reactions

RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); RGT (Reagent); PROC (Process); RACT (Reactant or reagent)

(process and catalysts for an integrated hydrogen peroxide prodn. for use in org.-compd. oxidns. using)

IT **7722-84-1P**, Hydrogen peroxide, preparation

RL: EPR (Engineering process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)

(process and catalysts for an integrated hydrogen peroxide prodn. for use in org.-compd. oxidns. using)

IT **1333-74-0**, Hydrogen, reactions

RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); RGT (Reagent); PROC (Process); RACT (Reactant or reagent)  
(process and catalysts for an integrated hydrogen peroxide prodn. for use in org.-compd. oxidns. using)

=> d L54 2-23 cbib abs hitind hitrn

L54 ANSWER 2 OF 23 HCA COPYRIGHT 2003 ACS on STN

137:142559 Catalytic direct production of hydrogen peroxide from hydrogen and oxygen feeds. Zhou, Bing; Rueter, Michael A.; Lee, Lap-keung; Pelrine, Bruce P. (USA). U.S. Pat. Appl. Publ. US 2002106320 A1 20020808, 13 pp., Cont.-in-part of U.S. Ser. No. 733,154. (English). CODEN: USXXCO.  
APPLICATION: US 2001-867190 20010529. PRIORITY: US 2000-733154 20001208.

AB In this catalytic process H2O2 is produced directly from H and O-contg. feeds by contacting them with a phase-controlled supported noble metal catalyst and a suitable org. liq. solvent having a Solvent Selection Parameter (SSP) between 0.14.times.10<sup>-4</sup> and 5.0.times.10<sup>-4</sup>, at 0-100.degree. and 100-3,000 psig pressure. Unconverted feed gas and org. liq. solvent soln. are recovered and recycled back to the reactor along with any recovered catalyst. If desired, the H2O2 product can be fed together with an org. chem. **feedstock** such as propylene and the org. liq. solvent soln. into a 2nd catalytic reaction step which oxidizes the **feedstock** to produce a desired crude oxidized org. product such as **propylene oxide**. This product can be purified by distn. and recovered from the solvent soln.

IC ICM C01B015-029

NCL 423584000

CC 49-8 (Industrial Inorganic Chemicals)

Section cross-reference(s): 67

IT 75-56-9P, **Propylene oxide**, preparation

**7722-84-1P**, Hydrogen peroxide, preparation

RL: EPR (Engineering process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)

(catalytic direct prodn. of hydrogen peroxide from hydrogen and oxygen feeds)

IT **1333-74-0**, Hydrogen, reactions 7782-44-7, Oxygen, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(catalytic direct prodn. of hydrogen peroxide from hydrogen and oxygen feeds)

IT **7722-84-1P**, Hydrogen peroxide, preparation

RL: EPR (Engineering process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)

(catalytic direct prodn. of hydrogen peroxide from hydrogen and oxygen feeds)

IT **1333-74-0**, Hydrogen, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(catalytic direct prodn. of hydrogen peroxide from hydrogen and oxygen feeds)

L54 ANSWER 3 OF 23 HCA COPYRIGHT 2003 ACS on STN

135:228874 Preparation of crystalline zeolite SSZ-55 using quaternary organic amines as a template and its use as a **catalyst** for the conversion of hydrocarbons. Elomari, Saleh; Harris, Thomas V. (Chevron U.S.A. Inc., USA). PCT Int. Appl. WO 2001066464 A2 20010913, 60 pp.  
DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,

LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2001-US6655 20010228. PRIORITY: US 2000-520640 20000307.

- AB A family of cryst. mol. sieves "zeolite SSZ-55" is obtained in its silicate, aluminosilicate, or borosilicate form having the following compn.:  $YO_2/WcOd$  with a mole ratio of 20-150, Y = Si, Ge, W = Al, Ga, Fe, B, Ti, In, V, c = 1 or 2, d = 2 if c = 1 or d = 3 or 5 if c = 2;  $M_2/n/YO_2$  with a mole ratio of 0.01-0.03, M = alkali metal cation or alk. earth cation and n is the valence of M; and Q/ $YO_2$  with a mole ratio of 0.02-0.05 and Q is phenylcycloalkylmethyl ammonium or N-cyclohexyl-N-(2-methylpropyl)pyrrolidinium cation. The zeolite is mainly in the **hydrogen** form and free of acidity. The zeolite can be used as a **catalyst** for processes, such as **hydrocracking**, dewaxing of hydrocarbons, the prodn. of a C20+ lube oil from C20+ olefins, increasing the octane of a hydrocarbon **feedstock** by conversion of hydrocarbons into aroms., alkylation and transalkylation of arom. hydrocarbons, isomerization or oligomerization of olefins, and the conversion of lower alcs. and other oxygenated hydrocarbons into liq. products. For the **catalytic** dewaxing of linear chain and slightly branched hydrocarbons in the presence of **hydrogen** at a pressure of 15-3000 psi the **catalyst** consists of a first layer contg. the described zeolite and a group VIII metal (**platinum**) and a second layer of an aluminosilicate zeolite which is more shape selective. For the conversion of paraffins into aroms. the **catalyst** contains also gallium, zinc or their mixt. In combination with a Fischer-Tropsch or methanol synthesis **catalyst** syngas can be converted into mainly liq. hydrocarbons. The zeolite contg. also metal or metal ions, such as cobalt or copper, can be used for the redn. of oxides of nitrogen in a gas **stream** in the presence of **oxygen** and could be placed in the exhaust **stream** of an internal combustion engine.
- IC ICM C01B039-12
- CC 49-3 (Industrial Inorganic Chemicals)  
Section cross-reference(s): 25, **51**, 59, 67
- ST zeolite SSZ55 template quaternary amine **catalyst**; hydrocarbon conversion **hydrocracking** dewaxing lubricant arom alkylation zeolite **catalyst**; isomerization oligomerization syngas zeolite **catalyst**; nitrogen oxide combustion engine exhaust zeolite **catalyst**
- IT Lubricating oils  
(C20+; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Alkanes, preparation  
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PREP (Preparation); PROC (Process)  
(C4-7, isomerization of; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Aromatic **hydrocarbons**, preparation  
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process); USES (Uses)  
(C7-9; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Zeolites (synthetic), preparation

RL: CAT (Catalyst use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(SSZ-55; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)

- IT Petroleum refining **catalysts**  
(alkylation, of arom. compds.; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Gasoline additives  
(antiknock; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Petroleum refining **catalysts**  
(conversion, for lower alcs.; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Petroleum refining **catalysts**  
(dewaxing; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Petroleum **cracking catalysts**  
Petroleum hydrotreating **catalysts**  
(**hydrocracking**; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Petroleum refining **catalysts**  
(isomerization, of olefins; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Exhaust gas **catalytic** converters  
(of NOx; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Polymerization **catalysts**  
(oligomerization, of olefins; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Transalkylation **catalysts**  
(petroleum refining, of arom. compds.; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Fischer-Tropsch **catalysts**  
Petroleum **cracking catalysts**  
(prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Borosilicate zeolites  
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)  
(prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT Silicates, preparation  
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)  
(prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)

- hydrocarbons)**
- IT Alcohols, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons)**
- IT Petroleum refining **catalysts**  
(transalkylation, of arom. compds.; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons)**
- IT 71-43-2, Benzene, reactions 100-41-4, Ethylbenzene, reactions 108-88-3, Toluene, reactions 1330-20-7, Xylene, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(alkylation or transalkylation of; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons)**
- IT 7440-06-4, **Platinum**, processes 7440-48-4, Cobalt, processes 7440-50-8, Copper, processes 7440-55-3, Gallium, processes 7440-66-6, Zinc, processes  
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons)**
- IT 11104-93-1, Nitrogen oxide, reactions  
RL: POL (Pollutant); RCT (Reactant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process); RACT (Reactant or reagent)  
(prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons)**
- IT 1303-86-2, Boron oxide, reactions 1312-43-2, Indium oxide 1332-37-2, Iron oxide, reactions 1344-28-1, Alumina, reactions 7631-86-9, Silica, reactions 11099-11-9, Vanadium oxide 12024-21-4, Gallium oxide 13463-67-7, Titanium oxide, reactions 157858-56-5, Germanium oxide  
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)  
(prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons)**
- IT 6837-24-7, 1-Cyclohexyl-2-pyrrolidinone 14377-68-5, 1-Phenyl-1-cyclobutanecarbonitrile 214262-90-5, Cyclopentanecarbonitrile, 1-(3-fluorophenyl)-  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(redn. of; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons)**
- IT 359715-62-1P 359715-66-5P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(synthesis and ion exchange of; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons)**
- IT 359715-64-3P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(synthesis and ion exchange; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons)**
- IT 7731-02-4P, N-Cyclohexylpyrrolidine 91245-59-9P, Cyclobutanemethanamine, 1-phenyl- 359715-61-0P

- RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(synthesis and quaternization of; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT 359715-63-2P 359715-65-4P 359715-67-6P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(synthesis of; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- IT 359715-58-5P 359715-59-6P 359715-60-9P  
RL: NUU (Other use, unclassified); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)  
(template; prepn. of cryst. zeolite SSZ-55 using quaternary org. amines as a template and its use as a **catalyst** for the conversion of **hydrocarbons**)
- L54 ANSWER 4 OF 23 HCA COPYRIGHT 2003 ACS on STN  
134:252763 **Catalysts** and sulfur-containing promoters for alkane oxidative **dehydrogenation** processes in the manufacture of vinyl acetate. Karim, Khalid; Khan, Asad (Saudi Basic Industries Corporation, Saudi Arabia). PCT Int. Appl. WO 2001021570 A1 20010329, 23 pp.  
DESIGNATED STATES: W: CN, ID, JP, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2.  
APPLICATION: WO 2000-EP8889 20000911. PRIORITY: US 1999-399275 19990917.
- AB Lower hydrocarbons (e.g., ethylene) are converted into carboxylic acids (e.g., acetic acid) and/or **dehydrogenated** hydrocarbon products (e.g., vinyl acetate) by contacting a **feed** mixt. contg. lower hydrocarbons, an **oxygen** source (e.g., **oxygen**), a diluent, and a sulfur-contg. compd. (e.g., sulfur dioxide), with a multifunctional, mixed-metal **catalyst** at 150-400.degree.. The lower C2-4 hydrocarbons and the presence of the sulfur compd. promoter in the **feed** mixt. results in an increased yield of carboxylic acid and/or **dehydrogenated** hydrocarbon product.
- IC ICM C07C051-215  
ICS C07C051-25; C07C053-08; C07C067-05; C07C069-15
- CC 35-2 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 23, 67
- ST vinyl acetate manuf ethylene oxidn; **catalyst** oxidn hydrocarbon manuf carboxylic acid
- IT Alkanes, reactions  
**Hydrocarbons**, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(C2-4; **catalysts** and sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT Carboxylic acids, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(**catalysts** and sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of)
- IT Oxidation  
(gas-phase; for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT Oxidation **catalysts**  
(gas-phase; mixed metal oxides with sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT Sulfonic acids, uses



- RL: CAT (Catalyst use); USES (Uses)  
(promoters; **catalysts** and sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT Molecular sieves  
(supports; metal oxides with for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-92-1, Lead, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-05-3, **Palladium**, uses 7440-09-7, Potassium, uses 7440-15-5, Rhenium, uses 7440-16-6, **Rhodium**, uses 7440-17-7, Rubidium, uses 7440-21-3, Silicon, uses 7440-23-5, Sodium, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-36-0, Antimony, uses 7440-38-2, Arsenic, uses 7440-42-8, Boron, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-55-3, Gallium, uses 7440-56-4, Germanium, uses 7440-57-5, **Gold**, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 7723-14-0, Phosphorus, uses 13494-80-9, Tellurium, uses
- RL: CAT (Catalyst use); USES (Uses)  
(**catalysts** and sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT 64-19-7P, Acetic acid, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(**catalysts** and sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT 74-84-0, Ethane, reactions 74-85-1, Ethene, reactions 74-98-6, Propane, reactions 115-07-1, Propene, reactions 7782-44-7, **Oxygen**, reactions 25167-67-3, Butene  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**catalysts** and sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7727-37-9, Nitrogen, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(diluent gas; **catalysts** and sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT 463-58-1, Carbon oxysulfide 7446-09-5, Sulfur dioxide, uses 7446-11-9, Sulfur trioxide, uses 7782-99-2, Sulfurous acid, uses 7783-06-4, **Hydrogen** sulfide, uses  
RL: CAT (Catalyst use); USES (Uses)  
(promoters; **catalysts** and sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)
- IT 409-21-2, Silicon carbide, uses 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 12627-57-5, Molybdenum carbide 13463-67-7, Titania, uses  
RL: CAT (Catalyst use); USES (Uses)  
(support; for **catalysts** and sulfur-contg. promoters for alkane oxidative **dehydrogenation** processes in the manuf. of vinyl acetate)

L54 ANSWER 5 OF 23 HCA COPYRIGHT 2003 ACS on STN

134:225083 Hybrid fuel-cell electric-combustion power system using complete pyrolysis. Manikowski, Ambrose F.; Noland, Gary M. (Procyon Power Systems, Inc., USA). PCT Int. Appl. WO 2001020703 A1 20010322, 36 pp.

DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US25267 20000913. PRIORITY: US 1999-396827 19990914.

AB This is a procedure for producing mech. power and a hybrid power generation unit for practising such a process. In particular, the procedure uses a thermal or **catalytic cracker** to **crack** or to pyrolyze (partially or completely) a liq. or gaseous petroleum fuel to produce a primary gaseous **stream** primarily contg. **hydrogen** (and likely methane or other short-chain hydrocarbons). The **hydrogen** may be used in a fuel cell to produce electricity, which electricity is used in a linear or rotary elec. motor. In the preferred procedure, the residuum of the pyrolyzed **feedstock** is laid down in the reactor. A regeneration step is used to remove that residuum and produce a carbon monoxide-rich gas which then may be introduced to an internal or external combustion engine for further prodn. of mech. power. Most preferred of the combustion engines is one having high thermal efficiency. This combination of pyrolysis, fuel cell, and high efficiency heat engine results in a procedure and device which is significantly more efficient in terms of utilizing the energy present in the **feedstock** hydrocarbon fuel. Addnl., under high temp. operation when the fuel to the engine is a carbon monoxide-rich gas, the emissions from the system will be substantially lower than for conventional power systems. Finally, when some portion of the process heat required by the pyrolysis and de-coking operations is obtained from waste heat from the engine, an increase in the total thermal content of the fuel can be realized, further increasing the overall fuel economy of the hybrid system.

IC ICM H01M008-06

ICS B60K006-04

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 48, 51, 59

IT Combustion engines

**Cracking catalysts**

Diesel engines

Fuel cells

Fuel gas manufacturing

Internal combustion engines

Thermal decomposition

Thermal decomposition **catalysts**

Turbines

(hybrid fuel-cell elec.-combustion power system using complete pyrolysis)

IT **Hydrocarbons**, uses

Petroleum, uses

RL: RCT (Reactant); TEM (Technical or engineered material use); RACT

(Reactant or reagent); USES (Uses)

(hybrid fuel-cell elec.-combustion power system using complete pyrolysis)

IT 1308-38-9, Chromic oxide, uses 7429-91-6, Dysprosium, uses 7439-88-5,

**Iridium**, uses 7439-89-6, Iron, uses 7439-94-3, Lutetium, uses

7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-00-8,

Neodymium, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses

7440-04-2, **Osmium**, uses 7440-05-3, **Palladium**, uses

7440-06-4, **Platinum**, uses 7440-10-0, Praseodymium, uses

7440-12-2, Promethium, uses 7440-15-5, Rhenium, uses 7440-16-6, **Rhodium**, uses 7440-18-8, **Ruthenium**, uses 7440-19-9, Samarium, uses 7440-25-7, Tantalum, uses 7440-26-8, Technetium, uses 7440-27-9, Terbium, uses 7440-30-4, Thulium, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-45-1, Cerium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-52-0, Erbium, uses 7440-53-1, Europium, uses 7440-54-2, Gadolinium, uses 7440-58-6, Hafnium, uses 7440-60-0, Holmium, uses 7440-62-2, Vanadium, uses 7440-64-4, Ytterbium, uses 7440-67-7, Zirconium, uses 7440-74-6, Indium, uses

RL: CAT (Catalyst use); USES (Uses)

(hybrid fuel-cell elec.-combustion power system using complete pyrolysis)

IT 630-08-0P, Carbon monoxide, uses **1333-74-0P, Hydrogen**, uses

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(hybrid fuel-cell elec.-combustion power system using complete pyrolysis)

IT 67-56-1, Methanol, uses 7732-18-5, Water, uses 7782-44-7, **Oxygen**, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(hybrid fuel-cell elec.-combustion power system using complete pyrolysis)

IT **1333-74-0P, Hydrogen**, uses

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(hybrid fuel-cell elec.-combustion power system using complete pyrolysis)

L54 ANSWER 6 OF 23 HCA COPYRIGHT 2003 ACS on STN

132:208271 Process for the production of olefins from hydrocarbons using alternative or additional sources of heat to drive the **cracking** step of the auto-thermal **cracking** process. Griffiths, David Charles; Oehlers, Cord; Reid, Ian Allan Beattie (BP Chemicals Limited, UK). PCT Int. Appl. WO 2000014036 A1 20000316, 21 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1999-GB2965 19990907. PRIORITY: GB 1998-19603 19980908.

AB The prodn. of olefins from hydrocarbons comprises: (A) providing a first **feed stream** comprising a gaseous fuel (e.g., ethane) and an **oxygen**-contg. gas; (B) contacting the first **feed stream** with a first **catalyst** under conditions so as to produce a product **stream** and unreacted **oxygen**; (C) providing a second **feed stream** comprising a hydrocarbon **feedstock**; and (D) contacting the second **feed stream**, the product **stream** of step B, and the unreacted **oxygen** of step B with a second **catalyst** which is capable of supporting oxidn., thereby consuming a part of the unreacted **oxygen** to produce an olefin (e.g., ethylene). This process provides alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process.

IC ICM C07C005-48

ICS C10G011-20

CC 35-2 (Chemistry of Synthetic High Polymers)

- Section cross-reference(s): 23, 48
- ST ethylene manuf; alkene manuf hydrocarbon **cracking**; olefin manuf hydrocarbon **cracking**
- IT **Cracking** (reaction)  
    **Cracking catalysts**  
    Steam  
    Synthesis gas  
        (process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process)
- IT Alkenes, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
    (process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process)
- IT **Hydrocarbons**, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
    (process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process)
- IT Natural gas, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
    (process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process)
- IT Fuel oil  
Gas oils  
    (process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process of)
- IT Alkanes, reactions  
Naphtha  
RL: RCT (Reactant); RACT (Reactant or reagent)  
    (process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process of)
- IT Gas oils  
    (vacuum; process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process of)
- IT 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-31-5, Tin, uses 7440-50-8, Copper, uses  
RL: CAT (Catalyst use); USES (Uses)  
    (**catalyst** for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process)
- IT 74-85-1P, Ethylene, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
    (**catalyst** for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process)
- IT 124-38-9P, Carbon dioxide, preparation 630-08-0P, Carbon monoxide, preparation 1333-74-0P, Hydrogen, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
    (process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process)

- IT 74-82-8, Methane, reactions 74-84-0, Ethane, reactions 74-98-6, Propane, reactions 106-97-8, Butane, reactions 7664-41-7, Ammonia, reactions 7782-44-7, **Oxygen**, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process)
- IT **1333-74-0P, Hydrogen**, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(process for the prodn. of olefins from **hydrocarbons** using alternative or addnl. sources of heat to drive the **cracking** step of the auto-thermal **cracking** process)
- L54 ANSWER 7 OF 23 HCA COPYRIGHT 2003 ACS on STN  
131:337521 Method and **catalysts** for the **dehydrogenation** of hydrocarbons with equilibrium-shifting oxidation of the byproduct **hydrogen** for increased unsaturated product yield. Iwakura, Tomoatsu; Takiguchi, Makoto (Mitsubishi Chemical Corporation, Japan). U.S. US 5994606 A 19991130, 7 pp., Cont.-in-part of U.S. Ser. No. 610,632, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1997-854134 19970508. PRIORITY: JP 1995-48740 19950308; JP 1995-69855 19950328; JP 1995-117053 19950516; JP 1995-117054 19950516; JP 1995-117055 19950516; US 1996-610632 19960304.
- AB A method for the **dehydrogenation** of a hydrocarbon comprises: (1) **dehydrogenating** a hydrocarbon feed (e.g., ethylbenzene) in the presence of a **dehydrogenation catalyst** to form a gas mixt. including a **dehydrogenated** hydrocarbon (e.g., styrene), an unreacted **feed** hydrocarbon, and **hydrogen**; (2) contacting the product mixt. from step 1 with an **oxygen**-contg. gas in the presence of an oxidn. **catalyst** comprising **platinum** and/or **palladium** supported on a carrier obtained by calcining, at 800-1500.degree., at least one member selected from tin oxide, titanium oxide, tantalum oxide, and niobium oxide, to selectively oxidize the byproduct **hydrogen**; and (3) further subjecting the hydrocarbon-contg. gas formed in step 2 to a second **dehydrogenation** reaction. The oxidn. of the byproduct **hydrogen** in the reaction mixt. serves to shift the reaction equil. toward producing more unsatd. hydrocarbon and a decreased reaction temp. can be used.
- IC ICM C07C005-333  
NCL 585660000  
CC 35-2 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 25, 48, 67
- ST ethylbenzene **dehydrogenation** styrene manuf; hydrocarbon **dehydrogenation** **hydrogen** oxidn; alkane **dehydrogenation** **hydrogen** oxidn manuf alkene
- IT **Dehydrogenation**  
(for the conversion of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen** for increased unsatd. product yield)
- IT Oxidation  
(gas-phase; for the conversion of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen** for increased unsatd. product yield)
- IT Oxidation **catalysts**  
(gas-phase; **platinum** and/or **palladium** supported on an metal oxide carrier for the conversion of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen** for increased unsatd. product yield)

- IT **Hydrocarbons, reactions**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(method and **catalysts** for the **dehydrogenation** of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen**)
- IT **Hydrocarbons, preparation**  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(unsatd.; method and **catalysts** for the **dehydrogenation** of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen**)
- IT **1333-74-0P, Hydrogen, preparation**  
RL: BYP (Byproduct); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(method and **catalysts** for the **dehydrogenation** of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen**)
- IT 7440-05-3, **Palladium**, uses 7440-06-4, **Platinum**, uses  
RL: CAT (Catalyst use); USES (Uses)  
(method and **catalysts** for the **dehydrogenation** of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen**)
- IT 100-42-5P, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(method and **catalysts** for the **dehydrogenation** of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen**)
- IT 100-41-4, **Ethylbenzene**, reactions 7782-44-7, **Oxygen**, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(method and **catalysts** for the **dehydrogenation** of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen**)
- IT 1313-96-8P, **Niobia** 1314-61-0P, **Ditantalum pentoxide** 13463-67-7P, **Titanium**, preparation 18282-10-5P, **Tin dioxide**  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(support; method and **catalysts** for the **dehydrogenation** of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen**)
- IT **1333-74-0P, Hydrogen, preparation**  
RL: BYP (Byproduct); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(method and **catalysts** for the **dehydrogenation** of **hydrocarbons** with equil.-shifting oxidn. of the byproduct **hydrogen**)

L54 ANSWER 8 OF 23 HCA COPYRIGHT 2003 ACS on STN

129:218874 Molecular sieve-based catalyst and process for the selective hydroisomerization of long straight chain and/or branched chain paraffins using this catalyst. Marcilly, Christian; Benazzi, Eric; George-Marchal, Nathalie (Institut Francais du Petrole, Fr.). Eur. Pat. Appl. EP 863198 A1 19980909, 9 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (French). CODEN: EPXXDW. APPLICATION: EP 1998-400386 19980218. PRIORITY: FR 1997-2598 19970305.

AB Hydroisomerization catalysts for long-chain (C.gtoreq.10) n-alkanes consist of a support, contg. .gtoreq.5 wt.% of a hydrogenation-**dehydrogenation** component (chosen from non-noble metals of Group VIII, Group VIB metals, and Nb of the Periodic Table), and .gtoreq.1 zeolite or mol. sieve with a pore size opening of 10 **oxygen** atoms. The suitability of the catalyst is defined such that, when it

contained 0.5 wt.% Pt, a 95% conversion of heptadecane was achieved with .gtoreq.70% selectivity to isomerized products. Isomerization is typically carried out at 1-250 bars, 170-500.degree., a vol. space velocity of 0.5-100 h-1, and a **H2-feedstock** ratio of 50-2000:1. Suitable zeolites are NU-10, NU-23, NU-87, Theta-1, and EU-13; the zeolites could also contain B, Ga, and/or Zn. Suitable **feedstocks** include fractions b. >175.degree. that could also contain n-alkylcycloalkanes and arom. hydrocarbons (e.g., middle distillates, vacuum residues, **hydrocracking** residues, Fischer-Tropsch paraffins, synthetic fractions, gas oils, **cracked** middle distillates, base lubricating oil fractions, and poly-.alpha.-olefins).

IC ICM C10G045-64

ICS B01J029-70

CC **51-9** (Fossil Fuels, Derivatives, and Related Products)

IT Hydrocarbon waxes, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(Fischer-Tropsch, **feedstock**; zeolite-based catalyst and process for selective hydroisomerization of long-chain paraffins)

IT Gas oils

(**feedstock**; zeolite-based catalyst and process for selective hydroisomerization of long-chain paraffins)

IT **Polyolefins**

RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(**feedstock**; zeolite-based catalyst and process for selective hydroisomerization of long-chain paraffins)

IT Petroleum refining residues

(**hydrocracking**, **feedstock**; zeolite-based catalyst and process for selective hydroisomerization of long-chain paraffins)

IT Petroleum refining residues

(vacuum distn., **feedstock**; zeolite-based catalyst and process for selective hydroisomerization of long-chain paraffins)

L54 ANSWER 9 OF 23 HCA COPYRIGHT 2003 ACS on STN

129:111217 Hydrotreating an organic **feedstock** to removal halogenated components. Moser, Mark D.; Kalnes, Tom N.; Jan, Chwu-ching (UOP LLC, USA). U.S. US 5773549 A 19980630, 9 pp., Cont.-in-part of U. S. Ser. No. 572,259, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1997-822532 19970324. PRIORITY: US 1993-151700 19931115; US 1995-572259 19951213.

AB The invention provides a process for hydrotreating an org.

**feedstock** contg. a halogenated component and contaminated with distillable **oxygen** compds., and/or distillable nitrogen compds. having b.ps. lower than the halogenated compds. by removing the distillable **oxygen** compds. and distillable nitrogen compds. with a fractionation zone and then contacting the resulting org. **feedstock** having a reduced concn. of distillable **oxygen** and nitrogen compds. and a gaseous recycle **stream** contg. hydrogen with a hydrogenation **catalyst** in a hydrogenation reaction zone to produce an anhyd. liq. **stream** comprising hydrogenated hydrocarbonaceous compds. having a reduced concn. of org. halide and a hydrogen halide compd. The resulting effluent from the hydrogenation zone is optionally sepd. to produce a hydrogenated hydrocarbonaceous **stream** having a reduced level of halogen and an anhyd. **stream** comprising a hydrogen halide compd.

IC ICM C10G045-02

NCL 208144000

CC **51-4** (Fossil Fuels, Derivatives, and Related Products)

ST fractionation bottoms removal haloorg compd; org **feedstock**

- removal haloorg compd
- IT Hydrocarbons, processes  
RL: REM (Removal or disposal); PROC (Process)  
(**chlorofluorocarbons**; hydrotreating an org. **feedstock**  
to removal halogenated components)
- IT Electric insulators  
(dielec. fluids; hydrotreating an org. **feedstock** to removal  
halogenated components)
- IT Alcohols, processes  
Ethers, processes  
RL: REM (Removal or disposal); PROC (Process)  
(halogenated; hydrotreating an org. **feedstock** to removal  
halogenated components)
- IT Petroleum refining **catalysts**  
(hydrogenation; hydrotreating an org. **feedstock** to removal  
halogenated components)
- IT Hydrogenation **catalysts**  
(hydrotreating an org. **feedstock** to removal halogenated  
components)
- IT 1344-28-1, Alumina, uses 7440-05-3, **Palladium**, uses  
RL: CAT (Catalyst use); USES (Uses)  
(hydrotreating an org. **feedstock** to removal halogenated  
components)
- IT 75-01-4, Vinyl chloride monomer, miscellaneous 75-56-9, Propylene oxide,  
miscellaneous 79-01-6, Trichloroethylene, miscellaneous 106-89-8,  
Epichlorohydrin, miscellaneous 107-05-1, Allyl chloride 107-06-2,  
Ethylene dichloride, miscellaneous 127-18-4, Perchloroethylene,  
miscellaneous  
RL: MSC (Miscellaneous)  
(hydrotreating an org. **feedstock** to removal halogenated  
components)
- IT 56-23-5, Carbon tetrachloride, processes 71-43-2D, Benzene, halogenated,  
processes 71-55-6, 1,1,1-Trichloroethane 92-52-4D, Biphenyl, chloro  
derivs.  
RL: REM (Removal or disposal); PROC (Process)  
(hydrotreating an org. **feedstock** to removal halogenated  
components)

L54 ANSWER 10 OF 23 HCA COPYRIGHT 2003 ACS on STN

126:212527 Process for producing **propylene oxide** from a  
**feedstream** comprising hydrogen and a carbon oxide. Vora, Bipin  
V.; Pujado, Peter R. (UOP Inc., USA). U.S. US 5599955 A  
19970204, 11 pp. (English). CODEN: USXXAM. APPLICATION: US 1996-605602  
19960222.

AB In the process, **propylene oxide** is produced from an  
alternate **feedstream** comprising hydrogen and a carbon oxide. A  
portion of the **feedstream** is passed to an oxygenate prodn. zone  
to produce an oxygenate **stream** comprising methanol and di-Me  
ether, and the oxygenate **stream** is passed to an olefin prodn.  
zone contg. a metal aluminophosphate catalyst to produce a propylene  
**stream**. The propylene **stream** is epoxidized with  
hydrogen peroxide which has been produced from hydrogen sepd. from a  
portion of the **feedstream**. The spent water **stream**  
produced by the epoxidn. reaction is treated to remove heavy components  
and returned to the hydrogen peroxide prodn. zone. The return of the  
unreacted propylene from the epoxidn. reaction zone for its subsequent  
recovery and recycle permits a less complicated, lower energy propylene  
sepn. The recycling of spent water from the epoxidn. reaction zone and  
the removal of heavy compds. eliminates a low value water **stream**  
and the recovery of heavy hydrocarbons therefrom produces a valuable



secondary product.

IC ICM C07D301-14  
ICS C07D301-16

NCL 549525000

CC 35-2 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 27

ST **propylene oxide** prepn hydrogen carbon monooxide;  
epoxidn **propylene** hydrogen carbon **oxide**

IT Silicoaluminophosphate zeolites  
RL: CAT (Catalyst use); USES (Uses)  
(SAPO-17, SAPO-34, SAPO-18; producing **propylene oxide**  
from **feedstream** comprising hydrogen and carbon oxide)

IT Aluminophosphates  
RL: CAT (Catalyst use); USES (Uses)  
(metal; producing **propylene oxide** from  
**feedstream** comprising hydrogen and carbon oxide)

IT Epoxidation  
(producing **propylene oxide** from **feedstream**  
comprising hydrogen and carbon oxide)

IT Synthesis gas  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(producing **propylene oxide** from **feedstream**  
comprising hydrogen and carbon oxide)

IT 42613-21-8, Titanium silicate  
RL: CAT (Catalyst use); USES (Uses)  
(producing **propylene oxide** from **feedstream**  
comprising hydrogen and carbon oxide)

IT 75-56-9P, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(producing **propylene oxide** from **feedstream**  
comprising hydrogen and carbon oxide)

IT 115-07-1P, 1-Propene, preparation 7722-84-1P, Hydrogen peroxide,  
preparation  
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation);  
RACT (Reactant or reagent)  
(producing **propylene oxide** from **feedstream**  
comprising hydrogen and carbon oxide)

IT 124-38-9, Carbon dioxide, reactions 630-08-0, Carbon monoxide, reactions  
1333-74-0, Hydrogen, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(producing **propylene oxide** from **feedstream**  
comprising hydrogen and carbon oxide)

IT 7722-84-1P, Hydrogen peroxide, preparation  
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation);  
RACT (Reactant or reagent)  
(producing **propylene oxide** from **feedstream**  
comprising hydrogen and carbon oxide)

IT 1333-74-0, Hydrogen, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(producing **propylene oxide** from **feedstream**  
comprising hydrogen and carbon oxide)

L54 ANSWER 11 OF 23 HCA COPYRIGHT 2003 ACS on STN  
126:186513 Integrated process for the production of **propylene**  
**oxide** from hydrogen- and propylene-rich hydrocarbon **stream**  
. Pujado, Peter R.; Hammerman, John I. (UOP Inc., USA). U.S.  
US 5599956 A 19970204, 6 pp. (English). CODEN: USXXAM. APPLICATION: US  
1996-606108 19960222.

AB **Propylene oxide** is produced by an integrated process  
utilizing as a basic **feedstock** a refinery **stream**

contg. satd. hydrocarbons. The first element of the process converts one or more of the satd. hydrocarbons to a **stream** contg. propylene and hydrogen using steam **cracking**, catalytic **cracking**, or preferably catalytic **dehydrogenation**. Hydrogen and propylene are sepd., and the hydrogen is employed in a reaction cycle affording hydrogen peroxide. The latter is then used to epoxidize propylene in the presence of a suitable catalyst, esp. a titanosilicate.

- IC ICM C07D301-12  
ICS C07D303-04
- NCL 549531000
- CC 35-2 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 51
- ST **propylene oxide** manuf satd hydrocarbon  
**feedstock**; hydrogen peroxide epoxidn propylene methyloxirane manuf
- IT Epoxidation  
(integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream**)
- IT Epoxidation catalysts  
(integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream** in presence of)
- IT Silicates, uses  
RL: CAT (Catalyst use); USES (Uses)  
(titanosilicates, catalyst; integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream** in presence of)
- IT 13463-67-7, Titania, uses  
RL: CAT (Catalyst use); USES (Uses)  
(catalytic support; integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream** in presence of)
- IT 75-56-9P, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream**)
- IT 115-07-1, 1-Propene, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream**)
- IT 7722-84-1P, Hydrogen peroxide, preparation  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream** employing hydrogen peroxide formed in the process)
- IT 1333-74-0, Hydrogen, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream** in presence of)
- IT 7722-84-1P, Hydrogen peroxide, preparation  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream** employing hydrogen peroxide formed in the process)
- IT 1333-74-0, Hydrogen, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(integrated process for the prodn. of **propylene oxide** from hydrogen- and propylene-rich hydrocarbon **stream** in presence of)

, presence of)

- L54 ANSWER 12 OF 23 HCA COPYRIGHT 2003 ACS on STN  
125:280295 **Hydrocracking** and Hydroisomerization of Long-Chain Alkanes and **Polyolefins** over Metal-Promoted Anion-Modified Zirconium Oxides. Venkatesh, K. R.; Hu, J.; Wang, W.; Holder, G. D.; Tierney, J. W.; Wender, I. (Department of Chemical and Petroleum Engineering, University of Pittsburgh, Pittsburgh, PA, 15261, USA). Energy & Fuels, 10(6), 1163-1170 (English) 1996. CODEN: ENFUEM. ISSN: 0887-0624. Publisher: American Chemical Society.
- AB Previous work on the **hydrocracking** and hydroisomerization of alkanes over metal-impregnated anion-modified zirconium oxides (AZOs) is extended to long-chain alkanes, from n-heptane to high mol. wt. **polyolefins**, using ZrO<sub>2</sub> modified by anion-derived groups such as SO<sub>4</sub> and WO<sub>3</sub> and promoted with hydrogenation metals such as Pt or Ni. Depending on reaction temp. and time, high yields of C<sub>5</sub>-C<sub>12</sub> isoalkanes or a mixt. of gases with high selectivities to isobutane and isopentane can be produced. The products do not contain olefins, aroms., or alkanes of carbon no. higher than the **feed**. The iso/normal ratios of the alkane products obtained are significantly higher than those predicted by isomerization equil. at the reaction conditions. It appears that higher (C<sub>7</sub>+) alkane **hydrocracking** over metal-promoted AZOs may not proceed via the conventional bifunctional mechanism involving initial **dehydrogenation** to an olefinic intermediate. The AZOs did not sinter or agglomerate during the **hydrocracking** reactions as indicated by particle size measurements. AZOs contg. WO<sub>3</sub> are more stable than those contg. SO<sub>4</sub>, retaining their anionic groups in reactions at severe reducing conditions [300+ .degree.C, 500-1200 psig (cold) H<sub>2</sub>]. XANES anal. of the Pt/ZrO<sub>2</sub>/WO<sub>3</sub> catalyst indicated that both Pt and W maintained their zerovalent (Pt<sup>0</sup>) and hexavalent (W<sup>6+</sup>) states, resp., during alkane **hydrocracking** as well as during recalcination in **air**.
- CC 51-6 (Fossil Fuels, Derivatives, and Related Products)  
Section cross-reference(s): 67
- ST alkane **polyolefin** hydroisomerization zirconia catalyst
- IT Gasoline  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(manuf. of; **hydrocracking** and hydroisomerization of long-chain alkanes and **polyolefins**)
- IT Petroleum refining catalysts  
(**hydrocracking**, for long-chain alkanes and **polyolefins**)
- IT Petroleum refining catalysts  
(hydroisomerization, for long-chain alkanes and **polyolefins**)
- IT Alkanes, reactions  
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(long-chain, **hydrocracking** and hydroisomerization of)
- IT Alkenes, reactions  
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(poly-, **hydrocracking** and hydroisomerization of)
- IT 7440-02-0, Nickel, uses 7440-06-4, Platinum, uses  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst promoter for zirconia; **hydrocracking** and hydroisomerization of long-chain alkanes and **polyolefins**)
- IT 1314-35-8, Tungsten trioxide, uses 14808-79-8, Sulfate, uses  
RL: CAT (Catalyst use); USES (Uses)  
(catalysts, platinum-/nickel-promoted zirconia contg.; **hydrocracking** and hydroisomerization of long-chain alkanes and

- polyolefins)**
- IT 1314-23-4, Zirconia, uses  
RL: CAT (Catalyst use); USES (Uses)  
(catalysts, platinum-/nickel-promoted, contg. sulfate/tungsten oxide;  
**hydrocracking** and hydroisomerization of long-chain alkanes and  
**polyolefins)**
- L54 ANSWER 13 OF 23 HCA COPYRIGHT 2003 ACS on STN
- 124:180385 Compositions comprising a substrate coated with a mesoporous growth-enhancing layer and a polycrystalline zeolite layer, manufacture of the compositions, and **catalytic** and separation processes using the compositions. Lai, Wenyih F.; Deckman, Harry W.; Mchenry, James A.; Verduijn, Johannes P. (Exxon Research and Engineering Co., USA). PCT Int. Appl. WO 9601687 A1 19960125, 44 pp. DESIGNATED STATES: W: AU, CA, JP, MX, SG; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1995-US8514 19950710. PRIORITY: US 1994-272361 19940708.
- AB The mesoporous growth-enhancing layer comprises .gtoreq.1 of zeolites, zeolite and metal oxides, zeolite and colloidal-size metals, colloidal-size metal and metal oxides, and the zeolites are selected from nanocryst. and colloidal-size zeolites, and the mesoporous growth-enhancing layer has interstices 20-2000 .ANG.. The compns. are manufd. by coating a substrate with a growth-enhancing layer as above prepd. by sol-gel process, and calcining the material, contacting the material with a zeolite-synthesis mixt., hydrothermally crystg. the material while settling of particles from the zeolite-synthesis mixt. is prevented, and removing any unreacted mixt. The sepn. processes comprise contacting **air** or a **feedstock** derived from petroleum, natural gas, or hydrocarbons with the compn. The **catalytic** processes comprise contacting a reaction **stream** with the compn.
- IC ICM B01D071-02  
ICS B01J037-02
- CC 49-4 (Industrial Inorganic Chemicals)  
Section cross-reference(s): 51, 57
- ST zeolite coating membrane sepn **catalyst**; petroleum membrane sepn **catalyst**; natural gas membrane sepn **catalyst**; hydrocarbon membrane sepn **catalyst**; sol gel coating stainless steel; ceramic coating sol gel; graphite coating sol gel
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(AEL, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(AFS, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(AFY, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(APC, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)

- (APD, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Aluminosilicates, uses  
Silicates, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Alkanes, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(kerosine contg.; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Kerosine  
RL: PUR (Purification or recovery); PREP (Preparation)  
(normal paraffin-contg.; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Metals, formation (nonpreparative)  
Oxides, formation (nonpreparative)  
Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Naphtha  
RL: PUR (Purification or recovery); PREP (Preparation)  
(substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Ceramic materials and wares  
(substrates; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Clays, uses  
Polymers, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(substrates; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(A, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(AFI, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(BeA, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(CsZSM 5, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Aromatic **hydrocarbons**, preparation

- RL: PUR (Purification or recovery); PREP (Preparation)  
(C10, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Alkenes, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(C5-10, coker naphtha contg. paraffins and; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(EU 1, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(KFI-type, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(KZSM 5, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(L, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(LiZSM 5, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(NaZSM 5, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(RbZSM 5, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(X, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(Y, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(ZSM 11, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)

- (ZSM 12, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(ZSM 23, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(ZSM 39, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(ZSM 5, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Phosphates, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(alumino-, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(aluminophosphate, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Phosphates, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(aluminosilico-, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(beta, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Glass, oxide  
RL: TEM (Technical or engineered material use); USES (Uses)  
(borosilicate, substrates; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(chabazite-type, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Naphtha  
RL: PUR (Purification or recovery); PREP (Preparation)  
(coker, paraffin- and olefin-contg.; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Gas oils  
(coker, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Petroleum products  
(**cracking** fractions, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for

- catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(faujasite-type, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(ferrierite-type, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(mazzite-type, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(mordenite-type, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(offretite-type, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Aluminosilicates, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(phospho-, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Petroleum products  
(reformates, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(silicalite, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(silicoaluminophosphate (SAPO), growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Coating process  
(sol-gel, substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(stannosilicate, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT Zeolites, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(theta 1, growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 1333-74-0P, Hydrogen, preparation



- RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with ammonia and **hydrogen** sulfide; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 7783-06-4P, **Hydrogen** sulfide, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with ammonia and **hydrogen**; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 75-28-5P, Isobutane  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with butane; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 74-85-1P, Ethylene, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with ethane and **hydrogen**; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 7440-01-9P, Neon, preparation 7440-37-1P, Argon, preparation  
7440-59-7P, Helium, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with ethane and methane; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 1330-20-7P, Xylene, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with ethylbenzene; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 74-84-0P, Ethane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with ethylene and **hydrogen**; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 7664-41-7P, Ammonia, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** and **hydrogen** sulfide; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 115-07-1P, Propylene, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** and propane; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 74-98-6P, Propane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** and propylene; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 74-82-8P, Methane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen**; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 106-97-8P, Butane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with isobutane; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)

- IT 109-66-0P, Pentane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with isopentane; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 7782-44-7P, **Oxygen**, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with nitrogen; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 7727-37-9P, Nitrogen, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **oxygen**; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 78-78-4P, Isopentane  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with pentane; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 100-41-4P, Ethylbenzene, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with xylene; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 7631-86-9, Ludox AS-40, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(colloidal; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 1314-23-4, Zirconia, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(growth-enhancing layer; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 7440-06-4, **Platinum**, uses 7440-22-4, **Silver**, uses  
7440-50-8, Copper, uses  
RL: CAT (Catalyst use); USES (Uses)  
(substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 1310-73-2, Sodium hydroxide, processes 13473-90-0, Aluminum nitrate  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 71-43-2P, Benzene, preparation 7704-34-9DP, Sulfur, compds.  
7727-37-9DP, Nitrogen, compds.  
RL: PUR (Purification or recovery); PREP (Preparation)  
(substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 409-21-2, Silicon carbide, uses 1302-88-1, Cordierite 1302-93-8, Mullite 1344-28-1, Alumina, uses 7440-21-3, Silicon, uses 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses 12033-89-5, Silicon nitride, uses 12597-68-1, Stainless steel, uses 13463-67-7, Titania, uses 14808-60-7, Quartz, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(substrates; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)
- IT 1941-30-6, Tetrapropylammonium bromide 4499-86-9, Tetrapropylammonium hydroxide

RL: NUU (Other use, unclassified); USES (Uses)  
(templating agent; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)

IT 1333-74-0P, **Hydrogen**, preparation

RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with ammonia and **hydrogen** sulfide; substrates coated with a mesoporous growth-enhancing layer and a polycryst. zeolite layer, for **catalytic** and sepn. processes)

L54 ANSWER 14 OF 23 HCA COPYRIGHT 2003 ACS on STN

124:180383 Compositions comprising a substrate and a polycrystalline zeolite layer, manufacture of the compositions, and separation of hydrocarbonaceous **feedstocks** and **catalyzing** chemical reactions with the coated substrates. Lai, Wenyih F. (Exxon Research and Engineering Co., USA). PCT Int. Appl. WO 9601685 A1 19960125, 30 pp. DESIGNATED STATES: W: AU, CA, JP, MX, SG; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1995-US8511 19950710. PRIORITY: US 1994-267760 19940708; US 1995-483343 19950607; US 1995-499719 19950707.

AB At least 99% of the zeolite crystals have .gtoreq.1 points between adjacent crystals .ltoreq.20 .ANG., an .gtoreq.90% of the crystals have width 0.2-100 .mu.m, and .gtoreq.75% of the crystal have thickness within 20% of the av. crystal thickness. The compns. are manufd. by contacting the substrates with a zeolite-synthesis mixt., hydrothermally treating the coated substrate at a temp. and for a duration sufficient to form a zeolite layer on the substrate while settling of particles produced from the zeolite-synthesis mixt. is prevented, and removing any unreacted mixt. Petroleum, natural gas, and hydrocarbon **feedstocks** selected from .gtoreq.1 of coal, bitumen, and kerogens, and **air** are sepd., and reactions are **catalyzed** with the compns. The compns. are unique in that the zeolite crystals making up one layer of the compn. are essentially continuous with no large voids, even when the zeolite layer has thickness <10 .mu.m.

IC ICM B01D071-02

ICS B01J037-02

CC 49-4 (Industrial Inorganic Chemicals)

Section cross-reference(s): 51

ST substrate coating zeolite membrane **catalyst**; alumina coating zeolite; stainless steel coating zeolite; petroleum **feedstock** sepn membrane; natural gas sepn membrane; hydrocarbon sepn membrane; **air** sepn membrane

IT Zeolites, formation (nonpreparative)

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(AEL; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)

IT Zeolites, formation (nonpreparative)

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(AFI; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)

IT Zeolites, formation (nonpreparative)

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(AFS; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)

IT Zeolites, formation (nonpreparative)

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(AFY; zeolite coating formation on substrates, and sepg.

- hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(APC; zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(APD; zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT **Platinum**-group metals  
RL: CAT (Catalyst use); USES (Uses)  
(**catalysts**; zeolite coating formation on substrates, and  
sepg. hydrocarbonaceous **feedstocks** and **catalyzing**  
chem. reactions with the coated substrates)
- IT Alkanes, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(kerosine contg.; zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Kerosine  
RL: PUR (Purification or recovery); PREP (Preparation)  
(normal paraffin-contg.; zeolite coating formation on substrates, and  
sepg. hydrocarbonaceous **feedstocks** and **catalyzing**  
chem. reactions with the coated substrates)
- IT Ceramic materials and wares  
(substrates; zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Clays, uses  
Glass, oxide  
Metals, uses  
Polymers, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(substrates; zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Coal liquids  
Coating process  
(zeolite coating formation on substrates, and sepg. hydrocarbonaceous  
**feedstocks** and **catalyzing** chem. reactions with the  
coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(zeolite coating formation on substrates, and sepg. hydrocarbonaceous  
**feedstocks** and **catalyzing** chem. reactions with the  
coated substrates)
- IT Bitumens  
RL: PUR (Purification or recovery); PREP (Preparation)  
(zeolite coating formation on substrates, and sepg. hydrocarbonaceous  
**feedstocks** and **catalyzing** chem. reactions with the  
coated substrates)
- IT **Hydrocarbons**, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(zeolite coating formation on substrates, and sepg. hydrocarbonaceous  
**feedstocks** and **catalyzing** chem. reactions with the  
coated substrates)
- IT Kerogens

- RL: PUR (Purification or recovery); PREP (Preparation)  
(zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Natural gas  
RL: PUR (Purification or recovery); PREP (Preparation)  
(zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Petroleum  
RL: PUR (Purification or recovery); PREP (Preparation)  
(zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Silicates, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(zeolites; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(A, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Aromatic **hydrocarbons**, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(C10, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT **Hydrocarbons**, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(C5-10, coker-naphtha contg.; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(EU 1, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(KFI-type, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(X, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(X, high-aluminum, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(Y, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)

- RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(ZSM 11, zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(ZSM 12, zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(ZSM 23, zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(ZSM 39, zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(ZSM 5, zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(aluminophosphate, zeolites; zeolite coating formation on substrates,  
and sepg. hydrocarbonaceous **feedstocks** and **catalyzing**  
chem. reactions with the coated substrates)
- IT Phosphates, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(aluminosilico-, zeolites; zeolite coating formation on substrates, and  
sepg. hydrocarbonaceous **feedstocks** and **catalyzing**  
chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(beta, zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Glass, oxide  
RL: TEM (Technical or engineered material use); USES (Uses)  
(borosilicate, substrates; zeolite coating formation on substrates, and  
sepg. hydrocarbonaceous **feedstocks** and **catalyzing**  
chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(chabazite-type, zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Gas oils  
(coker, zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Naphtha  
RL: PUR (Purification or recovery); PREP (Preparation)  
(coker, zeolite coating formation on substrates, and sepg.  
hydrocarbonaceous **feedstocks** and **catalyzing** chem.  
reactions with the coated substrates)
- IT Petroleum products  
(**cracking** fractions, zeolite coating formation on substrates,

- and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(faujasite-type, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(ferrierite-type, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(mordenite-type, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Order  
(orientational, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Aluminosilicates, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(phospho-, zeolites; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Petroleum products  
(reformates, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(silicate, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(silicoaluminophosphate (SAPO), zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(stannosilicate, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT Zeolites, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(theta 1, zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 7440-01-9P, Neon, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with argon, helium, and nitrogen; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 7440-59-7P, Helium, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with argon, neon, and nitrogen; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)

- IT 75-28-5P, Isobutane  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with butane; zeolite coating formation on substrates, and  
sepg. hydrocarbonaceous **feedstocks** and **catalyzing**  
chem. reactions with the coated substrates)
- IT 115-11-7P, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with butene; zeolite coating formation on substrates, and  
sepg. hydrocarbonaceous **feedstocks** and **catalyzing**  
chem. reactions with the coated substrates)
- IT 1330-20-7P, Xylene, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with ethylbenzene; zeolite coating formation on substrates,  
and sepg. hydrocarbonaceous **feedstocks** and **catalyzing**  
chem. reactions with the coated substrates)
- IT 7440-37-1P, Argon, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with helium, neon, and nitrogen; zeolite coating formation on  
substrates, and sepg. hydrocarbonaceous **feedstocks** and  
**catalyzing** chem. reactions with the coated substrates)
- IT 7783-06-4P, **Hydrogen** sulfide, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** and ammonia; zeolite coating  
formation on substrates, and sepg. hydrocarbonaceous **feedstocks**  
and **catalyzing** chem. reactions with the coated substrates)
- IT 74-85-1P, Ethene, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** and ethane; zeolite coating formation  
on substrates, and sepg. hydrocarbonaceous **feedstocks** and  
**catalyzing** chem. reactions with the coated substrates)
- IT 74-84-0P, Ethane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** and ethylene; zeolite coating  
formation on substrates, and sepg. hydrocarbonaceous **feedstocks**  
and **catalyzing** chem. reactions with the coated substrates)
- IT 7664-41-7P, Ammonia, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** and **hydrogen** sulfide;  
zeolite coating formation on substrates, and sepg. hydrocarbonaceous  
**feedstocks** and **catalyzing** chem. reactions with the  
coated substrates)
- IT 115-07-1P, 1-Propene, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** and propane; zeolite coating  
formation on substrates, and sepg. hydrocarbonaceous **feedstocks**  
and **catalyzing** chem. reactions with the coated substrates)
- IT 74-98-6P, Propane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** and propylene; zeolite coating  
formation on substrates, and sepg. hydrocarbonaceous **feedstocks**  
and **catalyzing** chem. reactions with the coated substrates)
- IT 1333-74-0P, **Hydrogen**, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen** sulfide and ammonia; zeolite coating  
formation on substrates, and sepg. hydrocarbonaceous **feedstocks**  
and **catalyzing** chem. reactions with the coated substrates)
- IT 74-82-8P, Methane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **hydrogen**; zeolite coating formation on  
substrates, and sepg. hydrocarbonaceous **feedstocks** and



- catalyzing** chem. reactions with the coated substrates)
- IT 106-97-8P, Butane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with isobutane; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 25167-67-3P, Butene  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with isobutene; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 109-66-0P, Pentane, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with isopentane; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 7782-44-7P, **Oxygen**, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with nitrogen; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 7727-37-9P, Nitrogen, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with **oxygen**; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 78-78-4P, Isopentane  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with pentane; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 100-41-4P, Ethylbenzene, preparation  
RL: PUR (Purification or recovery); PREP (Preparation)  
(admixts. with xylenes; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 7631-86-9, Ludox AS-40, processes  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(colloidal; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 1344-28-1, Alumina, uses 7440-21-3, Silicon, uses 7782-42-5, Graphite, uses 12597-68-1, Stainless steel, uses 14808-60-7, Quartz, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(substrates; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 4499-86-9, Tetrapropylammonium hydroxide  
RL: NUU (Other use, unclassified); USES (Uses)  
(templating agent; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 1310-73-2, Sodium hydroxide, processes 13473-90-0, Aluminum nitrate  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)
- IT 7704-34-9DP, Sulfur, compds. 7727-37-9DP, Nitrogen, compds.  
RL: PUR (Purification or recovery); PREP (Preparation)  
(zeolite coating formation on substrates, and sepg. hydrocarbonaceous

**feedstocks** and **catalyzing** chem. reactions with the coated substrates)

IT 1333-74-0P, **Hydrogen**, preparation

RL: PUR (Purification or recovery); PREP (Preparation) (admixts. with **hydrogen** sulfide and ammonia; zeolite coating formation on substrates, and sepg. hydrocarbonaceous **feedstocks** and **catalyzing** chem. reactions with the coated substrates)

L54 ANSWER 15 OF 23 HCA COPYRIGHT 2003 ACS on STN

124:31328 A review of advanced recycling technology. Mackey, George (Granville Res. Lab., Dow Chem. Co., Granville, OH, 43023-0515, USA). ACS Symposium Series, 609(Plastics, Rubber, and Paper Recycling), 161-9. (English) 1995. CODEN: ACSMC8. ISSN: 0097-6156. Publisher: American Chemical Society.

AB This paper reviews with 8 refs. the various processes put forth to convert mixed and unwashed waste plastic to a product with some economic value. Conventional mech. or melt recycling of plastics works well when the processes can acquire large quantities of reasonably clean, single polymer articles such as PET soda bottles or natural HDPE milk bottles. The remaining rigid or flexible plastics in the waste **streams** are often heavily contaminated, multilayered, heavily pigmented, and difficult to sort into single polymer **streams**. This portion of the waste plastic **stream**, nicknamed the third bale, is best recycled using a thermal process to convert the mix to a liq. product which is suitable as a refinery **feedstock**. The three major process subgroups used are (1) pyrolysis, (2) gasification, and (3) hydrogenation. Pyrolysis converts the material to a liq. in the absence of **oxygen** while gasification converted the plastic to a mix of carbon monoxide and **hydrogen** in a limited **oxygen** atm. Hydrogenation is a variance in the gasification process whereby **hydrogen** is added during the polymer **cracking** phase. An overview of the advantages and disadvantages of each process is described in this paper.

CC 38-0 (Plastics Fabrication and Uses)

ST pyrolysis plastic recycling technol review; gasification plastic recycling technol review; hydrogenation plastic recycling technol review; plastic bottle recycling technol review; **polyethylene** terephthalate bottle recycling technol review; bottle recycling technol review; HDPE bottle recycling technol review

IT 25038-59-9, **Polyethylene** terephthalate, uses

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses) (bottles; in advanced plastics recycling technol.)

IT 9002-88-4, **Polyethylene**

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses) (high-d., bottles; in advanced plastics recycling technol.)

L54 ANSWER 16 OF 23 HCA COPYRIGHT 2003 ACS on STN

118:237235 Novel regeneration method of **Pt**/KL zeolite

**catalyst** for light naphtha reforming. Sugimoto, Michio; Murakawa, Takashi; Hirano, Tomoaki; Ohashi, Hiroshi (Cent. Res. Lab. Idemitsu Kosan Co. Ltd., 1280 Kami-izumi, Sodegaura, Chiba, 299-02, Japan). Applied Catalysis, A: General, 95(2), 257-68 (English) 1993. CODEN: ACAGE4. ISSN: 0926-860X.

AB Treatment of KL zeolite with CF<sub>3</sub>Cl increased the **catalytic** activity for the aromatization of C<sub>6</sub> **feedstock**. Regeneration of the used **Pt catalyst** supported on the CF<sub>3</sub>Cl-treated KL zeolite (**Pt**/FKL) was studied. Deactivation of **Pt**/FKL was caused by sintering of the **Pt** particles, loss of halogen atoms, and coke formation during aromatization of the C<sub>6</sub> **feedstock**

. **Catalyst** performance of the **Pt**/FKL was restored by decoking in flowing 0.005% **CCl4** + 2% **O2** + 97.995% **N** from room temp. to 773 K, followed by treatment in flowing 0.8% Freon 112 (**CFC12CFC12**) + 10% **O2** + 89.2% **N2** at 773 K. From the results of the **IR** spectra of chemisorbed **CO** and terminal **OH** groups, it is suggested that the most important goal of regenerating the used **Pt**/FKL is to redisperse the **Pt** particles and restore their electronic state.

CC **51-6** (Fossil Fuels, Derivatives, and Related Products)

Section cross-reference(s): 67

ST **platinum** KL zeolite naphtha reforming; regeneration **platinum** reforming **catalyst** **chlorofluorocarbon**; sintering **platinum** reforming **catalyst** regeneration; **chlorofluoroethane** regeneration **platinum** reforming **catalyst**; **chloromethane** regeneration **platinum** reforming **catalyst**

IT Sintering

(of **platinum**-zeolite KL naphtha reforming **catalysts**, **catalyst** regeneration by treatment with **chlorofluorocarbons** in relation to)

IT Zeolites, uses

RL: CAT (Catalyst use); USES (Uses)

(KL, **catalysts**, contg. **platinum**, halided, for naphtha reforming, regeneration of, by treatment with **chlorofluorocarbons**)

IT Naphtha

RL: RCT (Reactant); RACT (Reactant or reagent)

(light, reforming of, **platinum**-zeolite KL **catalysts** for, regeneration of)

IT Petroleum refining **catalysts**

(reforming, **platinum**-zeolite KL, halided, for naphtha, regeneration of, by treatment with **chlorofluorocarbons**)

IT 56-23-5, Tetrachloromethane, uses 76-12-0, Freon 112

RL: USES (Uses)

(**catalyst** treatment with, for regeneration of **platinum**-zeolite KL naphtha reforming **catalysts**)

IT 7440-06-4P, **Platinum**, uses

RL: CAT (Catalyst use); PREP (Preparation); USES (Uses)

(**catalysts**, on zeolite KL, halided, for naphtha reforming, regeneration of, by treatment with **chlorofluorocarbons**)

IT 7440-44-0P, Carbon, preparation

RL: PREP (Preparation)

(formation and deposition of, on **platinum**-zeolite KL naphtha reforming **catalysts**, **catalyst** regeneration in relation to)

IT 75-72-9, Trifluorochloromethane

RL: USES (Uses)

(**platinum**-zeolite KL **catalysts** treated with, for naphtha reforming, regeneration of)

L54 ANSWER 17 OF 23 HCA COPYRIGHT 2003 ACS on STN

116:60020 Gas-phase oxidation of propylene by hydrogen peroxide. Nagiev, T. M.; Nagieva, Z. M.; Mustafaeva, Ch. A. (Inst. Teor. Probl. Khim. Tekhnol., Baku, USSR). Neftekhimiya, 31(5), 670-6 (Russian) 1991. CODEN: NEFTAH. ISSN: 0028-2421.

AB Gas-phase thermal transformation of propylene (I) in the presence of **H2O2** in a tubular reactor over a contact catalyst was accompanied by formation of **propylene oxide**, acrolein, allene, and methylacetylene in amts. depending on the reaction temp., contact time, and **H2O2** concn. A model of the mechanism of chem. transformation of I was

proposed and used to develop a kinetic model. Reaction rates of the reactions involved were calcd. The main active center in the transformation of I was the HO<sub>2</sub>.bul. radical. The proper choice of a catalyst made it possible to decrease the reaction temp. and the H<sub>2</sub>O<sub>2</sub> consumption. Silica-supported hematin catalyst exhibited high catalytic effectiveness.

- CC 35-2 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 22, 23, 45
- ST propylene transformation hydrogen peroxide; oxidn propylene hydrogen peroxide; epoxidn propylene hydrogen peroxide; **dehydrogenation** propylene hydrogen peroxide; methyloxirane prepn propylene epoxidn; acrolein prepn propylene oxidn; allene prepn propylene **dehydrogenation**; methylacetylene prepn propylene **dehydrogenation**; kinetics **dehydrogenation** epoxidn oxidn propylene; iron catalyst oxidn **dehydrogenation** propylene
- IT **Dehydrogenation** catalysts  
Epoxidation catalysts  
(gas-phase, for propylene in presence of hydrogen peroxide)
- IT Kinetics of **dehydrogenation**  
Kinetics of epoxidation  
Kinetics of oxidation  
(gas-phase, of propylene in presence of hydrogen peroxide)
- IT **Dehydrogenation**  
Epoxidation  
(gas-phase, of propylene in presence of hydrogen peroxide, mechanism of)
- IT 7631-86-9, Silica, uses  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst support, for hematin, for **dehydrogenation** and epoxidn. and oxidn. of propylene in presence of hydrogen peroxide)
- IT 1309-38-2, Magnetite, uses  
RL: CAT (Catalyst use); USES (Uses)  
(catalysts, for **dehydrogenation** and epoxidn. and oxidn. of propylene in presence of hydrogen peroxide)
- IT 15489-90-4, Hematin  
RL: CAT (Catalyst use); USES (Uses)  
(catalysts, silica-supported, for **dehydrogenation** and epoxidn. and oxidn. of propylene in presence of hydrogen peroxide)
- IT 115-07-1, Propylene, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**dehydrogenation** and epoxidn. and oxidn. of, gas-phase, in presence of hydrogen peroxide, mechanism and kinetics of)
- IT **1333-74-0**  
RL: USES (Uses)  
(**dehydrogenation**, gas-phase, of propylene in presence of hydrogen peroxide, mechanism of)
- IT 74-99-7P, Methylacetylene 463-49-0P, Allene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, by gas-phase **dehydrogenation** of propylene in presence of hydrogen peroxide and iron catalyst)
- IT 75-56-9P, **Propylene oxide**, preparation  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, by gas-phase epoxidn. of propylene in presence of hydrogen peroxide and iron catalyst)
- IT **7722-84-1**, Hydrogen peroxide, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(propylene **dehydrogenation** and epoxidn. and oxidn. by, mechanism and kinetics of gas-phase)
- IT **1333-74-0**  
RL: USES (Uses)

- (**dehydrogenation**, gas-phase, of propylene in presence of hydrogen peroxide, mechanism of)
- IT **7722-84-1**, Hydrogen peroxide, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(propylene **dehydrogenation** and epoxidn. and oxidn. by, mechanism and kinetics of gas-phase)
- L54 ANSWER 18 OF 23 HCA COPYRIGHT 2003 ACS on STN
- 107:23884 Process for **dehydrogenation** of alkylaromatic hydrocarbons.  
Imai, Tamotsu; Bricker, Jeffery C. (UOP Inc., USA). U.S. US 4652687 A  
19870324, 11 pp. (English). CODEN: USXXAM. APPLICATION: US 1986-882856  
19860707.
- AB Alkenyl-substituted arom. hydrocarbons are prepd. by subjecting alkyl-substituted arom. hydrocarbons to **dehydrogenation** in the presence of a **dehydrogenation catalyst**. The effluent **stream** from this step, comprising unconverted hydrocarbons, **dehydrogenated** hydrocarbons, H, and steam, is passed to an oxidn. step, in which the H is selective oxidized, in the presence of a O-contg. gas and an oxidn. **catalyst** comprising a Pd group metal, a Group IVA metal, and an alk. earth metal or alkali metal deposited on a metal oxide support (alumina), with the latter possessing a polylobular configuration contg. 3 to .apprx.8 lobes having a ratio of exterior surface to **catalyst** vol.  $> (4/D + 2/L)$  (D = largest representative diam.; L = particle length). The **dehydrogenation** and oxidn. reactions are conducted at 500-700.degree./0.1013-10.133 kPa. The **dehydrogenation catalysts** are alk. metal-promoted Fe compds. and may contain a Group IVB, VB, and VIB metal oxide or sulfide. An oxidn. **catalyst** was prepd. by adding a soln. comprising HNO<sub>3</sub> 37.0, Sn chloride 5.61, and H<sub>2</sub>O 1180 kg/kg alumina to boehmite powder having apparent bulk d. <0.8 g/mL and pore vol. >0.2 g/mL. The powder and soln. were stirred for .apprx.6 min, and the resultant dough was extruded to form a quadralobular configuration. The extrudate was dried for 3 h at 100.degree. in a forced draft oven, precalcined at 350.degree. for 2 h in flowing **air**, and at 600.degree. for 1 h. The temp. was maintained at 600.degree. for 1 h. The temp. was maintained at 600.degree. in flowing **air** for an addnl. 3 h, the extrudate cooled, then calcined by heating from ambient temp. to 1330.degree. over 10 h; this temp. was maintained for 3 addnl. h, followed by cooling to <300.degree. over 10 h. The **catalyst** composite was prepd. by charging aq. H<sub>2</sub>PtCl<sub>6</sub> soln. (Pt content 2.48%) to a flask so as to afford 0.4% Pt (based on the wt. of calcine support). An aq. LiNO<sub>3</sub> soln. (Li content 1.0%) was added to the soln. so as to afford 0.2% Li (based on the calcined support), HNO<sub>3</sub> was added to the flask to afford 2.3% HNO<sub>3</sub> (based on calcined support), and H<sub>2</sub>O was added to afford an impregnating soln./calcined support vol. ratio 1:1. This soln. was added to a glass-jacketed rotary evaporator, to which the calcined support was also added. A N purge was initiated while the mixt. was cold rolled for 15 min. Following the cold roll, steam was charged to the evaporator jacket and the liq. evapd. The **catalyst** compn. was dried in a forced draft oven at 150.degree. for 2 h, loaded into a quartz tube placed in a furnace, and calcined at 650.degree. over 2 h while passing a **stream** of **air** over the composite. When the **catalyst** bed reached 650.degree., a **stream** of **air** was passed over the composite which had been passed through water heated to 65.degree.. The temp. was maintained at 650.degree. while the **air**/steam atm. was passed over the **catalyst** surface for 2 h. The addn. of steam was discontinued while the **catalyst** was maintained at 650.degree. in an atm. of **air** for an addnl. 1 h, forming a **catalyst** composite contg. Pt 0.4, Sn 0.13, Li 0.19%, apparent bulk d. 0.5 g/mL, piece d.

1.23 g/mL, diam. 2.0 mm, particle length 6 mm, lobe length 1.1 mm, and lobe width 1.0 mm. A cylindrical **catalyst** similarly prepd. contained **Pt** 0.4, **Sn** 0.28, **Li** 0.18%, apparent bulk d. 0.70 g/mL, piece d. 1.5 g/mL, diam. 3.5 mm, and particle length 6 mm. An oxidn. reactor was charged with 35.09 g of the cylindrical **catalyst** and 25.25 g of the quadralobe **catalyst**, the reactor was heated to inlet temp. of 570.degree., and a **feedstock** comprising a **PhEt-PhCH:CH<sub>2</sub>**, steam, **H**, **O**, **N** (molar ratio 1.0:9:0.45:0.13:1), which simulated a product **stream** at .apprx.60% **PhEt** conversion from a second **dehydrogenation catalyst** bed of a 3 **dehydrogenation catalyst** bed reactor system (having an oxidn. **catalyst** bed positioned between the **dehydrogenation catalyst** beds), was fed to the reactor at a linear space velocity 10.3 h<sup>-1</sup>, with reactor outlet pressure 0.7 atm. In addn., the **air** in the **catalyst** bed was controlled to a max. of 630.degree. in the reactor. **H** combustion selectivity was measured after 30 h on **stream** and detd. to be 95.06% for the cylindrical-shaped **catalyst**, and 96.04% for the quadralobular-shaped **catalyst**. The wt. loading of the quadralobular **catalyst** was only 72% that of the cylindrical **catalyst** loading, but the performance of the quadralobular **catalyst** exceeded that of the cylindrical **catalyst** as shown above.

- IC ICM C07C004-02  
ICS C07C005-333  
NCL 585319000  
CC 35-2 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 25, 67  
ST alkylarom hydrocarbon **dehydrogenation** process; alkenyl arom hydrocarbon manuf process **catalyst**; oxidn **catalyst** hydrocarbon combustion selectivity; ethylbenzene **catalytic dehydrogenation** styrene manuf; mixed **dehydrogenation** oxidn **catalyst** reactor; quadralobular shaped oxidn **catalyst** support  
IT **Dehydrogenation catalysts**  
(alkali metal-promoted iron compds., for manuf. of alkenylaroms. from alkylaroms.)  
IT **Dehydrogenation catalysts**  
(alkali-promoted iron compds., for manuf. of alkenylaroms. from alkylarom. compds.)  
IT Group IVB element chalcogenides  
Group VB element chalcogenides  
Group VIB element chalcogenides  
RL: CAT (Catalyst use); USES (Uses)  
(**catalysts**, for **dehydrogenation** of alkyl aroms., alkenyl-substituted aroms. from)  
IT Group IVA elements  
RL: CAT (Catalyst use); USES (Uses)  
(**catalysts**, on quadralobular-shaped support, for oxidn. of **hydrogen** produced from **catalytic dehydrogenation** of alkyl aroms.)  
IT Alkali metals, uses and miscellaneous  
Alkaline earth metals  
RL: CAT (Catalyst use); USES (Uses)  
(**catalysts**, on quadralobular-shaped support, for oxidn. of **hydrogen** produced from **catalytic dehydrogenation** of alkylaroms.)  
IT **Platinum-group** metals  
RL: CAT (Catalyst use); USES (Uses)  
(**catalysts**, on quadrilobular support, for oxidn. of

- hydrogen** produced from **catalytic dehydrogenation** of alkyl arom. compds.)
- IT Aromatic **hydrocarbons**, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(alkyl, **dehydrogenation** of, alkenylaroms. from, **catalysts** for)
- IT Alkenes, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(aryl, manuf. of, from **catalytic dehydrogenation** of alkyl aroms., **catalysts** for)
- IT Oxidation **catalysts**  
(supports, alumina, quadrulobular-shaped, for combustion of **hydrogen** produced in **catalytic dehydrogenation** of alkylarom. compds.)
- IT 7439-89-6D, compds.  
RL: CAT (Catalyst use); USES (Uses)  
(**catalysts**, alkali metal-promoted, for **dehydrogenation** of alkylaroms. to alkenylaroms.)
- IT 1344-13-4, Tin chloride 7439-92-1, Lead, uses and miscellaneous  
7439-95-4, Magnesium, uses and miscellaneous 7440-05-3, uses and miscellaneous 7440-09-7, Potassium, uses and miscellaneous 7440-14-4, Radium, uses and miscellaneous 7440-16-6, **Rhodium**, uses and miscellaneous 7440-17-7, Rubidium, uses and miscellaneous 7440-23-5, Sodium, uses and miscellaneous 7440-24-6, Strontium, uses and miscellaneous 7440-39-3, Barium, uses and miscellaneous 7440-41-7, Beryllium, uses and miscellaneous 7440-46-2, Cesium, uses and miscellaneous 7440-70-2, Calcium, uses and miscellaneous 7790-69-4, Lithium nitrate 16941-12-1, Chloroplatinic acid  
RL: CAT (Catalyst use); USES (Uses)  
(**catalysts**, for selective **hydrogen** oxidn. in alkylarom. **dehydrogenation** process)
- IT 1333-74-0, **Hydrogen**, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(combustion of, in presence of quadrulobular oxidn. **catalyst** in 3-bed alkylarom. **dehydrogenation catalyst** reactor)
- IT 622-96-8, 4-Ethyltoluene  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**dehydrogenation** of, **catalysts** for)
- IT 100-42-5P, Styrene, preparation 622-97-9P, 4-Methylstyrene  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(manuf. of, oxidn. and **dehydrogenation catalysts** for)
- IT 7782-44-7, **Oxygen**, uses and miscellaneous  
RL: USES (Uses)  
(selective combustion of **hydrogen** in presence of quadrulobular **catalyst** and, in 3-bed alkylarom. **dehydrogenation** process)
- IT 1333-74-0, **Hydrogen**, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(combustion of, in presence of quadrulobular oxidn. **catalyst** in 3-bed alkylarom. **dehydrogenation catalyst** reactor)

L54 ANSWER 19 OF 23 HCA COPYRIGHT 2003 ACS on STN  
106:50774 **Oxygen** addition to oxidative reheat zone in hydrocarbon **dehydrogenation**. Ward, Dennis J. (UOP Inc., USA). U.S. US 4599471 A 19860708, 10 pp. (English). CODEN: USXXAM. APPLICATION: US 1985-776282 19850916.

AB Hydrocarbons are **dehydrogenated** in a reaction zone contg.

.gtoreq.2 sep. beds of **dehydrogenation catalysts**.  
Dehydration conditions of .apprx.538-750.degree./100-750 torr are used,  
and the hydrocarbon is mixed with superheated steam to counteract the  
temp. lowering effect of the endothermic reaction and prevent the  
accumulation of coke deposits on the **catalyst**. Steam is mixed  
with the **feed stream** at <3 lb steam/lb hydrocarbon.  
The **dehydrogenation** zone effluent contg. H is sepd., and the H  
fraction passed over a **Pt oxidn. catalyst**. The oxidn.  
**catalyst** is present in the **dehydrogenation** zone at,  
preferably, <30% of the hydrogenation **catalyst**, and the temp.  
rise across the **catalyst** bed is adjusted to react >75% of the H  
at liq. hourly space velocity 4-20 h<sup>-1</sup>. The oxidn. zone effluent is  
passed into a second bed of **dehydrogenation catalyst**  
increasing the amt. of H consumed by the **catalyst** without  
increasing the temp. of the oxidn. zone effluent, by decreasing the temp.  
of the mixt. of the **dehydrogenation** zone effluent and the  
O-contg. gas **stream** through a below ambient temp. O-contg. gas  
**stream**. The heat produced by H<sub>2</sub>O formation is transferred to the  
**dehydrogenation** zone.

- IC ICM C07C005-333  
ICS C07C005-32  
NCL 585441000  
CC 35-2 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 45, 48  
ST hydrocarbon **catalytic dehydrogenation** continuous; heat  
exchange oxidn zone; vaporized water cooling **dehydrogenation**  
effluent  
IT **Hydrocarbons, reactions**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**dehydrogenation** of, with dual **dehydrogenation**  
**catalyst** beds)  
IT Heat transfer  
(in **dehydrogenation** of **hydrocarbons**)  
IT **Dehydrogenation**  
(of **hydrocarbons**, dual **dehydrogenation**  
**catalyst** bed in, with **hydrogen**-selective oxidn.  
**catalyst** zone)  
IT 106-97-8, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**dehydrogenation** of, to butene)  
IT 25550-14-5, Ethyltoluene  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**dehydrogenation** of, to methylstyrene)  
IT 74-98-6, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**dehydrogenation** of, to propene)  
IT 100-41-4, Ethylbenzene, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**dehydrogenation** of, to styrene)  
IT 1333-74-0  
RL: USES (Uses)  
(**dehydrogenation**, of **hydrocarbons**, dual  
**dehydrogenation catalyst** bed in, with  
**hydrogen**-selective oxidn. **catalyst** zone)  
IT 1333-74-0  
RL: USES (Uses)  
(**dehydrogenation**, of **hydrocarbons**, dual  
**dehydrogenation catalyst** bed in, with  
**hydrogen**-selective oxidn. **catalyst** zone)



L54 ANSWER 20 OF 23 HCA COPYRIGHT 2003 ACS on STN

76:88250 Hydrocarbon isomerization **catalysts**. Wilhelm, Frederick C. (Universal Oil Products Co.). U.S. US 3630961 19711228, 8 pp. (English). CODEN: USXXAM. APPLICATION: US 1969-852463 19690822.

AB **Pt** and **Pb** compds. were uniformly distributed on a porous support and combined with a Friedel Crafts halide to isomerize C4-9 aromatic or aliphatic hydrocarbons. Thus, 1/16'' .gamma.-Al<sub>2</sub>O<sub>3</sub> spheres were prepd. from an Al hydroxychloride sol (cf. U.S. 2,620,314) and contacted with twice their vol. of 3% HNO<sub>3</sub>, H<sub>2</sub>PtCl<sub>6</sub>, and Pb(NO<sub>3</sub>)<sub>2</sub> for 0.5 hr. at 70.degree.F. The mixt. was dried at 225.degree.F and calcined 1 hr at 925.degree.F. The calcined product was contacted 4 hr at 925.degree.F with **air** contg. 40:1 H<sub>2</sub>O-HCl. Finished **catalyst** (I) had 0.375% **Pt**, 0.1% **Pb**, 0.85% **Cl**. Alternatively halide could be added as HF or AlCl<sub>3</sub>. When I reacted with a **feedstock** contg. PhEt 20, p-xylene 10, m-xylene 50, and o-xylene 20% at 2 liq. hourly space velocity and 425.degree.C/200 psig, the product was converted to essentially equil. p-xylene.

IC B01J

NCL 252439000

CC **51** (Petroleum, Petroleum Derivatives, and Related Products)  
Section cross-reference(s): 25

ST xylene isomerization; **catalyst** hydrocarbon isomerization

IT Fluorides, uses and miscellaneous

Halogens

RL: CAT (Catalyst use); USES (Uses)

(**catalysts**, contg. **platinum** for isomerization of hydrocarbons)

IT Alkanes, reactions

Alkenes, reactions

Aromatic hydrocarbons

Naphthenes

RL: RCT (Reactant); RACT (Reactant or reagent)

(isomerization of, **catalysts** for)

IT Isomerization **catalysts**

(lead-**platinum-halogen**, for **hydrocarbons**)

IT 7440-06-4, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)

(**catalysts**, contg. lead for isomerization of hydrocarbons)

IT 7439-92-1, uses and miscellaneous 7446-70-0, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)

(**catalysts**, contg. **platinum** for isomerization of hydrocarbons)

L54 ANSWER 21 OF 23 HCA COPYRIGHT 2003 ACS on STN

66:48145 Manufacture of aromatic hydrocarbons. Bakker, Lubertus (Standard Oil Co. (Ohio)). U.S. US 3297773 19670110, 4 pp. (English). CODEN: USXXAM. APPLICATION: US 19621204.

AB Aromatic hydrocarbons are manufd. by the **catalytic** dehydroaromatization of C6-12 normal paraffins in the presence of a salt of a heteropoly tungstic acid. A **catalyst** (**Pt** silicotungstate on alumina) contg. 0.3 **Pt** and having a WO<sub>3</sub> to **Pt** ratio of 3 to 1 is thus prepd. AlCl<sub>3</sub>, 708 g., dissolved in 800 ml. of H<sub>2</sub>O is added over 30 min. with stirring to 700 ml. of 15.1N NH<sub>4</sub>OH. The resulting gel is aged 30 min. in distd. H<sub>2</sub>O, slurried with 4 l. of distd. H<sub>2</sub>O, and isolated by suction filtration. The alumina filter cake is washed on the filter with 4 l. of 1% NH<sub>4</sub>OH and then back-washed with the same followed by 2 l. of H<sub>2</sub>O to yield a standard batch of pptd. alumina. A soln. of 300 g. of 10% aq. H<sub>2</sub>PtCl<sub>6</sub> is refluxed with 41.7 g. of NaOH until the soln. becomes clear. The soln. is cooled and adjusted to pH 4.5 with HOAc. The pptd. H<sub>2</sub>Pt(OH)<sub>6</sub> is sepd., washed with distd. H<sub>2</sub>O to

remove NaCl, recovered by filtration, and dried overnight in the air. A mixt. of 0.69 g. of **catalyst**, 100 ml. of H<sub>2</sub>O and 1.7 g. of tech.-grade silicotungstic acid (SiO<sub>2</sub>.12WO<sub>3</sub>.25H<sub>2</sub>O) is boiled with stirring for 2.5 hrs. to yield **Pt** silicotungstate. A mixt. of alumina, **Pt** silicotungstate, 420 ml. of distd. H<sub>2</sub>O, and 5 ml. of HOAc is stirred 15 min. The slurry is circulated for 15 min. through an Eppenbach bench-scale homogenizer, the homogenized gel is removed by filtration, and extruded as 1/8-in.-diam. cylinders. The cylinders are dried overnight at 240.degree.F., broken into 1/8-1/4 in. lengths, and calcined for 6 hrs. at 1000.degree.F. A **Pd** silicotungstate **catalyst** contg. 0.35% **Pd** and a **Pd** to WO<sub>3</sub> ratio of 3.5:1 and an **Ir** silicotungstate **catalyst** contg. 0.35% **Ir** and an **Ir** to WO<sub>3</sub> ratio of 3.5:1 are similarly prepd. The dehydroaromatization reaction is carried out by charging 150 ml. of **catalyst** into a tube placed in a furnace. The H and hydrocarbons are fed at one end and the products are condensed at the other of this tube. The **catalyst** is reduced by passing 0.3 ft.3/hr. of H at 1050.degree.F. over it for 8 hrs. After redn., the reaction pressure is held at 100 psig. and fresh H is introduced at 4 ft.3/hr. The **feed** is introduced at 172 ml./hr. These rates give a space velocity of 1.15 vols. of liquid hydrocarbon per vol. of **catalyst** per hr., and a H<sub>2</sub> to hydrocarbon mole ratio of 4 to 1. The hydrocarbon **feed** is a reformat having an API gravity of 55.2.degree., a boiling range of 214-372.degree.F., and a Reid vapor pressure of 1.0. It contains 3.9 ppm. S, no N, and 0.6 ppm. Cl. The runs lasted 1 hr. In a comparison of **Pt** silicotungstate **catalyst** with a conventional reduced silicotungstic acid on alumina, the following resp. results in vol. % were obtained overall: C<sub>3</sub> yield 69.7, 70.4; C<sub>1</sub>-C<sub>2</sub> yield (wt. %) 9.3, 13.4; aromatics formed 21.3, 9.2; loss on **cracking** 17.6, 20.9; aromatics 88.0, 66.0; olefins 5.0, 2.0; and satd. hydrocarbons 11.5, 22.0. The aromatic yield is 22 vol. % greater with the **Pt** silicotungstate **catalyst**.

NCL 260673500

CC 51 (Petroleum, Petroleum Derivatives, and Related Products)

ST AROMATIC HYDROCARBONS MANUF; HYDROCARBONS AROMATIC MANUF;  
DEHYDROAROMATIZATION PARAFFINS; PARAFFINS DEHYDROAROMATIZATION;  
**CATALYSTS** AROMATICS MANUF

IT Aromatization

(dehydrogenation-, of paraffins to aromatic  
hydrocarbons, **catalysts** for, **platinum**  
tungstosilicate as)

IT Paraffins, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)  
(dehydrogenation-aromatization of, **catalysts** for,  
**platinum** tungstosilicate as, for aromatic hydrocarbon manuf.)

IT Hydrocarbons, preparation

RL: PREP (Preparation)  
(manuf. of aromatic, by paraffin dehydrogenation  
-aromatization, **catalysts** for, **platinum**  
tungstosilicate as)

IT Dehydrogenation catalysts

(platinum tungstosilicate, for paraffins)

IT Tungstosilicic acid (H<sub>4</sub>SiW<sub>12</sub>O<sub>40</sub>), **platinum** salt, tricosahydrateRL: USES (Uses)  
(for dehydrogenation-aromatization of paraffin to aromatic  
hydrocarbons)

L54 ANSWER 22 OF 23 HCA COPYRIGHT 2003 ACS on STN

65:89651 Original Reference No. 65:16741e-h Hydrocarbon conversions in the  
presence of used and reactivated **platinum** reforming

**catalysts.** Shipikin, V. V.; Maslyanskii, G. N.; Zharkov, B. B.; Bursian, N. R. Neftekhimiya, 6(3), 401-6 (Russian) 1966. CODEN: NEFTAH. ISSN: 0028-2421.

- AB The conversions were studied on: (1) fresh **catalyst**, (2) **catalyst** after 15,000 hrs. use in a pilotplant **catalytic** reformer (Khim. i Tekhnol. Topliv i Masel 7(2), 5(1962)), (3) activated by chlorination at 500.degree. and atm. pressure in **air** contg. 1.5 mole % Cl passed at a space velocity of 1000 hr.<sup>-1</sup> and with subsequent calcination in **air** at 500.degree. for 6 hrs. to remove C deposits and reduce Cl to 0.8-0.9 wt. %, and (4) activated after removal of Fe and Na. **Pt**, Cl, F, Fe, and Na<sub>2</sub>O contents of (1) were 0.58, 0.58, 0.36, 0.01, and 0.012%; of (2) 0.58, 0.07, 0.06, 1.00, and 0.40; of (3) 0.58, 0.80, 0.06, 0.15, and 0.40; and of (4) 0.58, 0.80, 0.06, 0.01, and 0.003 wt. %, resp. C<sub>6</sub>H<sub>14</sub> was isomerized at 470.degree., 40 atm., **feed** rate 100-420 vols./ vol./hr., H/C<sub>6</sub>H<sub>14</sub> mole ratio 6:1 in a **catalyst** dild. with 4 times its wt. of scrap Al-wire. The yields of iso-C<sub>6</sub>H<sub>14</sub> for (1)-(4) were 32, 3, 20, and 24.5 wt. %, resp., at a space velocity of 10 hr. Cyclohexane (I) was **dehydrogenated** at 470.degree., 20 atm., H<sub>2</sub>/I mole ratio 6:1 and I **feed** rate 2.8-3.0 hr.<sup>-1</sup> on a **catalyst** dild. with 40 times its wt. of scrap Al. The product was C<sub>6</sub>H<sub>6</sub> only. The rate const.  $k = V_0 \ln 1/(1 - x) - 0.83 V_0 x$ , where  $V_0$  is moles I/sec./l. of **catalyst** and  $x$  is mole fraction I reacted, for (1-4) 0.16, 0.10, 0.12, and 0.15, resp. (2) is only .apprx.4% less active than I while (4) .apprxeq. (1) in activity. The small improvement due to 1 chlorination indicates that Fe supresses the **dehydrogenating** role of **catalyst**, n-C<sub>8</sub>H<sub>18</sub> (II) was dehydrocyclized at 470.degree., 20 atm., H<sub>2</sub>/II mole ratio 6:1, II **feed** rate 1.5 hr.<sup>-1</sup> The **catalyst** was sepd. from C<sub>4</sub>H<sub>10</sub> at atm. pressure and rectified on a 30-plate column. (1-4) yielded 35.6, 6.9, 40.7, and 45.4 wt. % based on (2), resp., of aromatics, of which 6.8, 5.8, 35.0, and 37.4 wt. %, resp., were C<sub>8</sub>. Higher yields for (3) and (4) confirm that Cl has a greater dehydrocyclizing effect than F on paraffins (CA 64, 17309f). Aromatization of II by (1-4) is similar to isomerization of C<sub>6</sub>H<sub>14</sub>, but not to **dehydrogenation** of I indicating the role of surface acidity of **Pt catalysts** in dehydrocyclization under reforming conditions.
- CC 27 (Petroleum and Petroleum Derivatives)
- IT **Hydrocarbons**  
(conversion of, with reactivated and used **Pt catalysts**)
- IT **Catalysts and Catalysis**  
(in hydrocarbon reactions, in reactivated and used **Pt** as)
- IT **Dehydrogenation**  
Isomerization  
Ring closure or formation  
(of **hydrocarbons**, reactivated and used **Pt catalysts** in)
- IT Chlorination  
(**platinum catalyst** reactivation by, for hydrocarbon conversions)
- IT Reforming  
(**platinum** reactivated and used **catalysts** in)
- IT 7440-06-4, **Platinum**  
(**catalysts**, hydrocarbon conversion with reactivated and used)

L54 ANSWER 23 OF 23 HCA COPYRIGHT 2003 ACS on STN

52:38128 Original Reference No. 52:6840a-c Hydrocarbon resin dispersions.

Hunter, Edward A.; Small, Augustus B. (Esso Research and Engineering Co.).

US 2809948 19571015 (Unavailable). APPLICATION: US .

AB Hydrocarbon resins, such as those prepd. from steam-cracked

petroleum **streams**, yield stable aq. dispersions when emulsified with an octylphenoxypoly(ethoxy)ethanol and a fatty amine-**ethylene oxide** condensation product. Thus, 350 g. of a hydrocarbon resin (m. 70.degree.) is heated to 95.degree. and mixed with 30 g. Ethomeen S-12, 10 g. dodecyltrimethylammonium chloride, and 0 g. octylphenoxypoly(ethoxy)ethanol (about 5 ethoxy units). A total of 400 cc. of water is added at 95.degree.. After cooling to 60.degree., the latex is dild. to 10 wt. % solids with water. The stable resin dispersion is particularly useful for impregnating paper, cardboard, and other fibrous materials.

CC 31 (Synthetic Resins and Plastics)

IT Petroleum refining

(**cracked** distillates or fractions from, emulsions of resins from)

IT Amines

(reaction product, with **ethylene oxide**, as emulsifying agents for hydrocarbon resins)

IT **Polyethylene** glycol, octylphenyl ether

(as emulsifying agent for hydrocarbon resins)

IT **7722-84-1, Hydrogen peroxide**

(decompn. of, catalysis by Co(II)-amino acid complexes, formation of peroxodicobalt(III) complex intermediates in)

IT **7722-84-1, Hydrogen peroxide**

(decompn. of, catalysis by Co(II)-amino acid complexes, formation of peroxodicobalt(III) complex intermediates in)

=> file energy

FILE 'ENERGY' ENTERED AT 11:54:09 ON 28 JUL 2003

COPYRIGHT (c) 2003 USDOE for the IEA-Energy Technology Data Exchange (ETDE)

FILE LAST UPDATED: 24 JUL 2003 . <20030724/UP>

FILE COVERS 1974 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN  
THE BASIC INDEX >>>

=> d L91 1-4 all

L91 ANSWER 1 OF 4 ENERGY COPYRIGHT 2003 USDOE/IEA-ETDE on STN

AN 1993(19):123184 ENERGY

TI Oxidative removal of cyanide from aqueous streams abetted by ultraviolet irradiation.

AU Frame, R.R.; Kalnes, T.N.; Moser, M.D.

CS UOP, Des Plaines, IL (United States)

PI US 5238581 A 24 Aug 1993 [10 p.]

Patent and Trademark Office, Box 9, Washington, DC 20232 (United States)

AI US 7-862,149 2 Apr 1992

DT Patent; Availability Note

CY United States

LA English

FA AB

AB A method is described of reducing the concentration of complexed cyanide in an aqueous stream containing at least one complexed cyanide which dissociates to afford less than 10% of the total cyanide present in the complexed cyanide as free cyanide ions. The method comprises the following: irradiating the aqueous stream with light of a wavelength effective to dissociate the complexed cyanide and afford free cyanide ions, and oxidizing the cyanide to carbon dioxide, nitrogen, and isocyanate with an oxidizing agent selected from the group consisting of

oxygen ozone, and hydrogen peroxide in the presence of a catalytically effective amount of a metal chelate at oxidation conditions. The metal chelate is selected from the group consisting of metal compounds of tetrapyridinoporphyrine, porphyrin, corrinoid materials, and the phthalocyanines

IC C02F001-032  
CC \*540320; 540220  
CT AQUEOUS SOLUTIONS; CYANIDES; OXIDATION; REMOVAL; ULTRAVIOLET RADIATION  
\*CYANIDES: \*OXIDATION  
BT CHEMICAL REACTIONS; DISPERSIONS; ELECTROMAGNETIC RADIATION; MIXTURES; RADIATIONS; SOLUTIONS

L91 ANSWER 2 OF 4 ENERGY COPYRIGHT 2003 USDOE/IEA-ETDE on STN  
AN 1989(19):133365 ENERGY  
TI Kinetic study of the epoxidation of 1-octene with hydrogen peroxide catalyzed by platinum(II) complexes. Evidence of the involvement of two metal species in the oxygen-transfer step.  
AU Zanardo, A.; Pinna, F.; Michelin, R.A.; Strukul, G. (Univ. of Venice (Italy)) [Italy]  
SO Inorg. Chem. (1 Jun 1988) v. 27(11) p. 1966-1973  
CODEN: INOCAJ ISSN: 0020-1669  
DT Journal; Numerical Data  
CY United States  
LA English  
AB A detailed kinetic study of the epoxidation of 1-octene with hydrogen peroxide catalyzed by Pt(II) complexes is reported. The two systems analyzed were (diphoe)Pt(CF<sub>3</sub>)(OH)/1-octene/H<sub>2</sub>O<sub>2</sub>/THF and ((diphoe)Pt(CF<sub>3</sub>)(CH<sub>2</sub>Cl<sub>2</sub>))BF<sub>4</sub>/1-octene/H<sub>2</sub>O<sub>2</sub>/H<sub>2</sub>O/CH<sub>2</sub>Cl<sub>2</sub>. Rate data were determined with GLC from epoxide formed vs time plots. Evidence for many of the organometallic intermediates and the individual steps involved was gained from IR studies, 19F NMR studies, and especially designed experiments including studies of the acidity effect. In both cases the kinetic analysis suggests a mechanism in which the actual oxidant is a PtOOH species that interacts with a Pt-olefin complex in the oxygen-transfer step (second-order dependence on platinum). 29 references, 12 figures, 3 tables.  
CC \*400201; 400202; B1210; B1220  
CT \*FLUORINATED ALIPHATIC HYDROCARBONS: \*CATALYTIC EFFECTS; \*ORGANIC PHOSPHORUS COMPOUNDS: \*CATALYTIC EFFECTS; \*PLATINUM COMPLEXES: \*CATALYTIC EFFECTS; \*ALKENES: \*CHEMICAL REACTIONS; \*HYDROGEN PEROXIDE: \*CHEMICAL REACTIONS; EXPERIMENTAL DATA  
BT COMPLEXES; DATA; HALOGENATED ALIPHATIC HYDROCARBONS; HYDROCARBONS; HYDROGEN COMPOUNDS; INFORMATION; NUMERICAL DATA; ORGANIC COMPOUNDS; ORGANIC FLUORINE COMPOUNDS; ORGANIC HALOGEN COMPOUNDS; OXYGEN COMPOUNDS; PEROXIDES; TRANSITION ELEMENT COMPLEXES  
ET Pt; C\*H\*F\*O\*Pt; Pt(CF<sub>3</sub>)(OH); Pt cp; cp; C cp; F cp; O cp; H cp; H\*O; H<sub>2</sub>O<sub>2</sub>; C\*H\*Cl\*F\*Pt; Pt(CF<sub>3</sub>)(CH<sub>2</sub>Cl<sub>2</sub>); Cl cp; B\*F; BF<sub>4</sub>; B cp; H<sub>2</sub>O; C\*H\*Cl; CH<sub>2</sub>Cl<sub>2</sub>; F; 19F; is; F is; H\*O\*Pt; PtOOH

L91 ANSWER 3 OF 4 ENERGY COPYRIGHT 2003 USDOE/IEA-ETDE on STN  
AN 1981(5):19960 ENERGY  
TI Method and arrangement for the precipitation of fly ash from flue gases. (Patent.)  
AU Olson, W.I.; Gaunt, R.H.; Lynch, J.G. [United States]  
CS Assignee(s): UOP, Inc., Des Plaines, IL (USA)  
PI DE 2806479 A 23 Aug 1979  
31 p.  
DT Patent  
CY Germany, Federal Republic of  
LA German

AB Heated HSO is injected with pressurized air through Venturi nozzles into the flue gas stream as a mist to improve the electrostatic precipitation of the fly ash. The nozzles are fixed at the end of probes. The droplet size is nearly 10 m. All parts of the plants that come into contact with HSO are coated with polytetrafluoroethylene.

CC \*010800

CT \*ELECTROSTATIC PRECIPITATORS: \*EFFICIENCY; \*SULFURIC ACID: \*INSPECTION; \*FLUE GAS: \*PURIFICATION; \*FLY ASH: \*REMOVAL; ATOMIZATION; CORROSION PROTECTION; DROPLETS; GAS FLOW; PARTICLE SIZE; POLYTETRAFLUOROETHYLENE; PROTECTIVE COATINGS; SEPARATION PROCESSES

BT AEROSOL WASTES; COATINGS; EQUIPMENT; FLUID FLOW; FLUORINATED ALIPHATIC HYDROCARBONS; GASEOUS WASTES; HALOGENATED ALIPHATIC HYDROCARBONS; HYDROGEN COMPOUNDS; INORGANIC ACIDS; ORGANIC COMPOUNDS; ORGANIC FLUORINE COMPOUNDS; ORGANIC HALOGEN COMPOUNDS; ORGANIC POLYMERS; PARTICLES; POLLUTION CONTROL EQUIPMENT; POLYETHYLENES; POLYMERS; POLYOLEFINS; SIZE; WASTES

L91 ANSWER 4 OF 4 ENERGY COPYRIGHT 2003 USDOE/IEA-ETDE on STN

AN 1977(24):146026 ENERGY

TI Platinization of platinum-doped Kocite electrodes in phosphoric acid fuel cells. Interim progress report No. 3, September--December 1976.

AU Welsh, L.B.; Leyerle, R.W. [United States]

CS UOP, Inc., Des Plaines, IL (USA) (9502837)

NC DAAG53-76-C-0014

NR AD-A--039242

Mar 1977. 85 p. Availability: NTIS PC A05/MF A01.

DT Report

CY United States

LA English

DN ERA-03:004103

AB The use of UOP platinum impregnated Kocite materials as low-cost air and/or fuel electrocatalysts in phosphoric acid electrolyte fuel cells has been optimized with respect to some of the electrocatalyst and electrode structure parameters. Kocite materials are composite structures consisting of pyropolymers chemically bonded to refractory substrates. Fuel cell electrodes were fabricated from these materials and tested as anodes or cathodes in model fuel cells with Teflon-bonded platinum-black counter electrodes.

CC \*300503

CT \*ACID ELECTROLYTE FUEL CELLS: \*CATALYSTS; ELECTRODES; FABRICATION; PERFORMANCE TESTING; PHOSPHORIC ACID; PLATINUM; POLYMERS; REFRACTORIES; TEFLON

BT DIRECT ENERGY CONVERTERS; ELECTROCHEMICAL CELLS; ELEMENTS; FLUORINATED ALIPHATIC HYDROCARBONS; FUEL CELLS; HALOGENATED ALIPHATIC HYDROCARBONS; HYDROGEN COMPOUNDS; INORGANIC ACIDS; METALS; ORGANIC COMPOUNDS; ORGANIC FLUORINE COMPOUNDS; ORGANIC HALOGEN COMPOUNDS; ORGANIC POLYMERS; PETROCHEMICALS; PETROLEUM PRODUCTS; PLASTICS; PLATINUM METALS; POLYETHYLENES; POLYMERS; POLYOLEFINS; POLYTETRAFLUOROETHYLENE; TESTING; TRANSITION ELEMENTS

=> file encomppat2

FILE 'ENCOMPPAT2' ENTERED AT 11:54:28 ON 28 JUL 2003

EnComppat2 compilation and indexing (C) 2003

Elsevier Engineering Information Inc. All rights reserved.

FILE COVERS 1964 TO 18 Jul 2003 (20030718/ED)

This database is provided on an "as is" basis. Users should consult

original source material. THERE ARE NO WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED. Elsevier Engineering Information will not be liable for any loss of profit, goodwill or any other damages arising out of use of this database.

CAUTION: Some displays of the LT field are extremely long. Enter NEWS FILE at the arrow prompt for more information.

The Indexing Template (TD) field is available for some records starting with 940901/ED. Enter HELP TEMPLATE at an arrow prompt (=>) for information on how to use this field.

There is a two-hour limit on non-Supporter usage of the ENCOMPLIT2 and ENCOMPPAT2 files. This limit is the combined usage by an organization of both files on all vendors.

Reproduction, redistribution, or resale of information in whole or in part in any form or medium without express written permission of EnCompass is prohibited.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d L110 1-18 all

L110 ANSWER 1 OF 18 ENCOMPPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN  
AN 2000:9744 ENCOMPPAT;ENCOMPPAT2  
DN P200015849  
TI New crystalline titanostannosilicate molecular sieve catalyst with a  
microporous framework structure used in the preparation of  
**epoxides from olefins**  
IN LEWIS G J; NEMETH L; ROSIN R R  
PA UOP LLC  
PI US 6074624 20000613  
AI US 1997-840531 19970422  
US 1998-109854 19980702  
PRAI US 1998-109854 19980702  
US 1997-840531 19970422  
FI US 6074624 20000613  
OS DERWENT 2000430382  
IC C01B039-06  
CC CATALYSTS/ZEOLITES; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM; ZEOLITES  
CT 1344-13-4-A; 5593-70-4-A; 7631-86-9-A; ACTIVITY; AGITATING; ATE-P; C12-A;  
C13-16-A; C3-A; C4-A; C8-A; CALCINING; \*CATALYST-\*P; CATALYST ACTIVITY;  
\*CATALYST PREPARATION; CHLORINE-A; COMPOSITION; COMPOUNDS-AP;  
CONCENTRATION; CRYSTAL; CRYSTAL SIZE; \*CRYSTALLIZATION; DETERIORATION;  
\*EPOXIDATION; EPOXY-P; GROUP IVA-AP; GROUP IVB-AP; GROUP VIA-AP; GROUP  
VIIA-A; HYDROCARBON-A; HYDROXIDE-A; IDE-A; INORGANIC SOLVENT; METAL  
ORGANIC-A; MICROPORE; MICROSTRUCTURE; MOLECULAR SIEVE-P; MOLECULAR  
STRUCTURE; MONOAMINE-A; OLEFIN-A; OPERATING CONDITION; ORGANIC SALT-A;  
\*OXIDATION REACTION; OXYGEN-AP; OXYGEN ORGANIC-A; PARTICLE SIZE; \*PHASE  
CHANGE; PHYSICAL PROPERTY; PORE SIZE; REACTION TIME; SATURATED CHAIN-A;  
SILICA-A; SILICON-AP; SILICON ORGANIC-A; SINGLE STRUCTURE TYPE-A; SOLID;  
\*SOLIDIFICATION; SOLUTION; SOLVENT; STRAIGHT CHAIN-A; TEMPERATURE;  
TEMPERATURE 125 TO 200 C; TEMPERATURE 300 TO 600 C; TEMPERATURE 80 TO 125  
C; TEMPLATE-A; TETRABUTYL TITANATE-A; TIN-AP; TIN CHLORIDE-A; TITANIUM-AP;  
TRANSITION METAL-AP; UNIVERSAL OIL PRODUCTS; UNSATURATED-A; US PAT;  
VALENCE; WATER-NA

LT ATE-P; CATALYST-P; CRYSTAL; GROUP IVA-P; GROUP IVB-P; GROUP VIA-P;  
MICROPORE; MICROSTRUCTURE; MOLECULAR SIEVE-P; MOLECULAR STRUCTURE;  
OXYGEN-P; PORE SIZE; SILICON-P; TIN-P; TITANIUM-P; TRANSITION METAL-P;  
VALENCE

LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A

LT C4-A; C8-A; OXYGEN ORGANIC-A; SATURATED CHAIN-A; SILICON ORGANIC-A; SINGLE  
STRUCTURE TYPE-A

LT C3-A; GROUP IVB-A; METAL ORGANIC-A; OXYGEN ORGANIC-A; SATURATED CHAIN-A;  
SINGLE STRUCTURE TYPE-A; TITANIUM-A; TRANSITION METAL-A

LT C12-A; GROUP VIA-A; HYDROXIDE-A; MONOAMINE-A; ORGANIC SALT-A; SATURATED  
CHAIN-A; SINGLE STRUCTURE TYPE-A; TEMPLATE-A

LT INORGANIC SOLVENT; SOLVENT; WATER

LT 1344-13-4-A; CHLORINE-A; GROUP IVA-A; GROUP VIIA-A; IDE-A; TIN-A; TIN  
CHLORIDE-A; WATER-A

LT COMPOUNDS-A; GROUP IVB-A; METAL ORGANIC-A; OXYGEN ORGANIC-A; SATURATED  
CHAIN-A; SINGLE STRUCTURE TYPE-A; TITANIUM-A; TRANSITION METAL-A

LT C12-A; C8-A; GROUP IVB-A; METAL ORGANIC-A; OXYGEN ORGANIC-A; SATURATED  
CHAIN-A; SINGLE STRUCTURE TYPE-A; TITANIUM-A; TRANSITION METAL-A

LT 5593-70-4-A; C13-16-A; GROUP IVB-A; METAL ORGANIC-A; OXYGEN ORGANIC-A;  
SATURATED CHAIN-A; SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A; TETRABUTYL  
TITANATE-A; TITANIUM-A; TRANSITION METAL-A

LT COMPOUNDS-A; GROUP IVA-A; METAL ORGANIC-A; OXYGEN ORGANIC-A; SATURATED  
CHAIN-A; SINGLE STRUCTURE TYPE-A; TIN-A

LT 7631-86-9-A; GROUP IVA-A; GROUP VIA-A; IDE-A; OXYGEN-A; SILICA-A;  
SILICON-A

LT COMPOUNDS-A; OXYGEN ORGANIC-A; SATURATED CHAIN-A; SILICON ORGANIC-A;  
SINGLE STRUCTURE TYPE-A

LT C12-A; GROUP VIIA-A; IDE-A; MONOAMINE-A; ORGANIC SALT-A; SATURATED  
CHAIN-A; SINGLE STRUCTURE TYPE-A; TEMPLATE-A

LT COMPOUNDS-P; EPOXY-P

ATM Template not available

L110 ANSWER 2 OF 18 ENCOMPPAT2 COPYRIGHT.2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 2000:1271 ENCOMPPAT;ENCOMPPAT2

DN P200002194

TI Selective **epoxidation** of non-allylic **olefins** in  
presence of fluorinated hydrocarbons

IN BARNICKI S D; MONNIER J R

PA EASTMAN CHEM CO

PI US 6011163 20000104

AI US 1999-315107 19990520

PRAI US 1999-315107 19990520

FI US 6011163 20000104

OS DERWENT 2000146459

IC C07D301-10

CC CATALYSTS/ZEOLITES; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM PROCESSES; PETROLEUM REFINING AND PETROCHEM;  
PLANT SAFETY

CT 106-97-8; 106-99-0-A; 1344-28-1; 25154-42-1; 74-85-1-A; 75-21-8-P;  
75-73-0; 1,3-BUTADIENE-A; ACTIVITY; ALUMINUM; ALUMINUM OXIDE; BOND ENERGY;  
BUTANE; C1; C2-NAP; C4-NAP; CALCINING; CARBON TETRAFLUORIDE;

**\*CATALYST; CATALYST ACTIVITY; CATALYST**

SUPPORT; CESIUM; CHLOROBUTANE; CHLOROHYDROCARBON; COMPOSITION;  
COMPOUNDS-NAP; CONCENTRATION; EFFICIENCY; ELEMENT-NA; \*EPOXIDATION;  
EPOXY-P; ETHYLENE-A; ETHYLENE OXIDE-P; FLAMMABILITY; FLOW RATE;

**FLUOROHYDROCARBON**; GAS; GROUP IA; GROUP IB; GROUP IIIA; GROUP  
VIA-NA; HALOHYDROCARBON; HELIUM; HYDROCARBON-NA; HYDROGEN; IDE; ISOTHERMAL  
CONDITION; MIXTURE; MONOOLEFINIC-AP; MULTIOLEFINIC-A; NOBLE GAS; NOBLE  
METAL; OLEFIN-A; \*OPERATING CONDITION; \*OXIDATION REACTION; OXYGEN-NA;



OXYGEN CONTENT; PHYSICAL PROPERTY; PRECIOUS METAL; REACTION TIME;  
REPLACEMENT; \*SAFETY; SATURATED CHAIN; SELECTIVITY; SILVER; SINGLE  
STRUCTURE TYPE-NAP; SPECIFIC HEAT; STRAIGHT CHAIN-NA; TEMPERATURE;  
TEMPERATURE 200 TO 300 C; TERMINAL OLEFINIC-AP; THERMAL PROPERTY;  
TRANSITION METAL; UNSATURATED-A; UNSATURATED CHAIN-AP; US PAT; YIELD  
LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A  
LT 75-73-0; C1; C2; CARBON TETRAFLUORIDE; FLUOROHYDROCARBON; HALOHYDROCARBON;  
SATURATED CHAIN; SINGLE STRUCTURE TYPE  
LT ELEMENT-A; GROUP VIA-A; OXYGEN-A  
LT CATALYST; COMPOUNDS; GROUP IB; NOBLE METAL; PRECIOUS METAL; SILVER;  
TRANSITION METAL  
LT 74-85-1-A; C2-A; ETHYLENE-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE  
STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A  
LT 106-99-0-A; 1,3-BUTADIENE-A; C4-A; HYDROCARBON-A; MULTIOLEFINIC-A; SINGLE  
STRUCTURE TYPE-A; STRAIGHT CHAIN-A; TERMINAL OLEFINIC-A; UNSATURATED  
CHAIN-A  
LT 75-21-8-P; C2-P; EPOXY-P; ETHYLENE OXIDE-P; SINGLE STRUCTURE TYPE-P  
LT C4-P; EPOXY-P; MONOOLEFINIC-P; TERMINAL OLEFINIC-P; UNSATURATED CHAIN-P  
LT COMPOUNDS-P; EPOXY-P  
LT 1344-28-1; ALUMINUM; ALUMINUM OXIDE; CATALYST; CESIUM; COMPOUNDS; GROUP  
IA; GROUP IB; GROUP IIIA; GROUP VIA; IDE; NOBLE METAL; OXYGEN; PRECIOUS  
METAL; SILVER; TRANSITION METAL  
LT 1344-28-1; ALUMINUM; ALUMINUM OXIDE; CATALYST SUPPORT; GROUP IIIA; GROUP  
VIA; IDE; OXYGEN  
LT ELEMENT; HELIUM; NOBLE GAS  
LT ELEMENT; HYDROGEN  
LT 106-97-8; BUTANE; C4; HYDROCARBON; SATURATED CHAIN; SINGLE STRUCTURE TYPE;  
STRAIGHT CHAIN  
LT 25154-42-1; C4; CHLOROBUTANE; CHLOROHYDROCARBON; HALOHYDROCARBON;  
SATURATED CHAIN; SINGLE STRUCTURE TYPE; STRAIGHT CHAIN  
ATM Template not available

L110 ANSWER 3 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 1999:665 ENCOMPAT;ENCOMPAT2

DN 9950108

TI **Catalyst** compositions for **epoxidation** of  
**olefins** with an organic hydroperoxide - are prepared by  
impregnation of silica with a solution of titanium halide in a  
non-oxygenated hydrocarbon solvent in the absence of water, useful for  
preparation of propylene oxide

IN CARROLL K M; GASTINGER R G; HAN Y; MORALES E

PA ARCO CHEM TECHNOLOGIE NEDERLAND BV; ARCO CHEM TECHNOLOGY LP

PI WO 9850374 19981112

DS AL; AM; AT; AU; AZ; BA; BB; BG; BR; BY; CA; CH; CN; CU; CZ; DE; DK; EE;  
ES; FI; GB; GE; GH; GM; GW; HU; ID; IL; IS; JP; KE; KG; KP; KR; KZ; LC;  
LK; LR; LS; LT; LU; LV; MD; MG; MK; MN; MW; MX; NO; NZ; PL; PT; RO; RU;  
SD; SE; SG; SI; SK; SL; TJ; TM; TR; TT; UA; UG; UZ; VN; YU; ZW; AT; BE;  
CH; CY; DE; DK; EA; ES; FI; FR; GB; GH; GM; GR; IE; IT; KE; LS; LU; MC;  
MW; NL; OA; PT; SD; SE; SZ; UG; ZW

AI WO 1998-EP2681 19980504

PRAI US 1998-60375 19980415

US 1997-900794 19970725

US 1997-851105 19970505

FI WO 9850374 19981112

OS DERWENT 98610308

LA English

IC C07D301-00

CC CATALYSTS/ZEOLITES; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM

CT 100-41-4; 106-98-9-A; 107-01-7-A; 109-67-1-A; 109-68-2-A; 111-66-0-A; 111-67-1-A; 11130-18-0; \*115-07-1-A; 124-11-8-A; 142-82-5; 19689-19-1-A; 3071-32-7-A; 497-19-8; 592-41-6-A; 592-43-8-A; 592-47-2-A; 592-76-7-A; 592-77-8-A; 592-78-9-A; 592-99-4-A; \*75-56-9-P; 75-91-2-A; 7631-86-9; 7647-01-0; 766-07-4-A; 80-15-9-A; 872-05-9-A; 1-BUTENE-A; 1-DECENE-A; 1-HEPTENE-A; 1-HEXENE-A; 1-NONENE-A; 1-OCTENE-A; 1-PENTENE-A; 1-PHENYLETHYL HYDROPEROXIDE-A; 2-BUTENE-A; 2-HEPTENE-A; 2-HEXENE-A; 2-OCTENE-A; 2-PENTENE-A; 3-HEPTENE-A; 3-HEXENE-A; 4-OCTENE-A; 5-DECENE-A; 6 MEMBER RING-A; ACTIVITY; AIR; ALKENE-A; ANHYDROUS; AROMATIC HYDROCARBON; ATE; ATLANTIC RICHFIELD; BED; BENZENE RING-NA; BRANCHED CHAIN-A; C1; C10-A; C13-16-A; C17-25-A; C2; \*C3-N\*A\*P; C4-NA; C5-A; C5-12-NA; C6-A; C7-NA; C8-NA; C9-A; CALCINING; CARBON; \*CATALYST; CATALYST ACTIVITY; CATALYST SUPPORT; CHLORINE; COMPOSITION; COMPOUNDS-NAP; CONCENTRATION; COOLING; CUMENE HYDROPEROXIDE-A; CYCLOHEXYL HYDROPEROXIDE-A; DRY; DRYING; ELEMENT; \*EPOXIDATION; \*EPOXY-P; ETHYLBENZENE; FIXED BED; FLOW RATE; FLUID FLOW; GAS; GROUP IA; GROUP IVA; GROUP IVB; GROUP VIA; GROUP VIIA; HALOHYDROCARBON-NA; HEATING; HEPTANE; \*HYDROCARBON-N\*A; HYDROCARBON SOLVENT; HYDROGEN; HYDROGEN CHLORIDE; IDE; IMPREGNATING; INERT; INORGANIC SOLVENT; INTERNAL OLEFINIC-A; ISOMER; LIQUID; MATERIALS TESTING; MIXING; MIXTURE; MOLECULAR STRUCTURE; MONOAMINE-A; MONOHYDROXY-A; \*MONOOLEFINIC-A; MULTIAMINE-A; NITROGEN ORGANIC-A; NONE; NONHYDROCARBON SOLVENT; OLEFIN-A; OPERATING CONDITION; ORGANIC SOLVENT; \*OXIDATION REACTION; OXYGEN; OXYGEN CONTENT; OXYGEN ORGANIC-NA; OXYGEN-FREE; PEROXY-A; PHYSICAL PROPERTY; PHYSICAL SEPARATION; PROCESS STREAM; \*PROPENE-A; \*PROPYLENE OXIDE-P; REACTOR; REDUCTION REACTION; SATURATED CARBOCYCLIC-A; \*SATURATED CHAIN-NA\*P; SCRUBBING; SELECTIVITY; SILICA; SILICON; SILICON ORGANIC-A; SILYLATION; \*SINGLE STRUCTURE TYPE-N\*A; SODIUM; SODIUM CARBONATE; SODIUM CARBONATE, NA2CO3; SOLID; SOLUTION; SOLVENT; SPACE VELOCITY; STEAM; STRAIGHT CHAIN-NA; STRUCTURAL ISOMER; TEMPERATURE; TEMPERATURE 125 TO 200 C; TEMPERATURE 200 TO 300 C; TEMPERATURE 300 TO 600 C; TEMPERATURE 600 C AND HIGHER; \*TERMINAL OLEFINIC-A; TERT-BUTYL HYDROPEROXIDE-A; TITANIUM; TITANIUM CHLORIDE; TRANSITION METAL; UNSATURATED-NA; \*UNSATURATED CHAIN-N\*A; VAPOR; WASHING; WATER; WATER CONTENT; WATER VAPOR; YIELD

LT 142-82-5; C7; HEPTANE; HYDROCARBON; HYDROCARBON SOLVENT; ORGANIC SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE TYPE; SOLVENT; STRAIGHT CHAIN

LT 7647-01-0; CHLORINE; GROUP VIIA; HYDROGEN; HYDROGEN CHLORIDE; IDE

LT 497-19-8; ATE; CARBON; GROUP IA; GROUP IVA; GROUP VIA; OXYGEN; SODIUM; SODIUM CARBONATE; SODIUM CARBONATE, NA2CO3

LT C6-A; NITROGEN ORGANIC-A; SATURATED CHAIN-A; SILICON ORGANIC-A; SINGLE STRUCTURE TYPE-A

LT 100-41-4; BENZENE RING; C8; ETHYLBENZENE; HYDROCARBON; SATURATED CHAIN

LT 11130-18-0; 7631-86-9; CATALYST; CHLORINE; GROUP IVA; GROUP IVB; GROUP VIA; GROUP VIIA; IDE; OXYGEN; SILICA; SILICON; TITANIUM; TITANIUM CHLORIDE; TRANSITION METAL

LT 7631-86-9; CATALYST SUPPORT; GROUP IVA; GROUP VIA; IDE; OXYGEN; SILICA; SILICON

LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A

LT COMPOUNDS-P; EPOXY-P

LT COMPOUNDS-A; PEROXY-A

LT INORGANIC SOLVENT; SOLVENT; WATER

LT COMPOUNDS; NONE; OXYGEN ORGANIC

LT 115-07-1-A; C3-A; HYDROCARBON-A; MONOOLEFINIC-A; PROPENE-A; SINGLE STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A

LT 75-56-9-P; C3-P; EPOXY-P; PROPYLENE OXIDE-P; SATURATED CHAIN-P

LT 3071-32-7-A; 1-PHENYLETHYL HYDROPEROXIDE-A; BENZENE RING-A; C8-A; PEROXY-A; SATURATED CHAIN-A

LT ALKENE-A; C3-A; C4-A; C5-12-A; COMPOUNDS-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; UNSATURATED CHAIN-A

LT 106-98-9-A; 109-67-1-A; 111-66-0-A; 124-11-8-A; 592-41-6-A; 592-76-7-A;  
872-05-9-A; 1-BUTENE-A; 1-DECENE-A; 1-HEPTENE-A; 1-HEXENE-A; 1-NONENE-A;  
1-OCTENE-A; 1-PENTENE-A; C10-A; C4-A; C5-A; C6-A; C7-A; C8-A; C9-A;  
HYDROCARBON-A; ISOMER; MOLECULAR STRUCTURE; MONOOLEFINIC-A; SINGLE  
STRUCTURE TYPE-A; STRAIGHT CHAIN-A; STRUCTURAL ISOMER; TERMINAL  
OLEFINIC-A; UNSATURATED CHAIN-A  
LT 107-01-7-A; 109-68-2-A; 111-67-1-A; 19689-19-1-A; 592-43-8-A; 592-47-2-A;  
592-77-8-A; 592-78-9-A; 592-99-4-A; 2-BUTENE-A; 2-HEPTENE-A; 2-HEXENE-A;  
2-OCTENE-A; 2-PENTENE-A; 3-HEPTENE-A; 3-HEXENE-A; 4-OCTENE-A; 5-DECENE-A;  
C10-A; C4-A; C5-A; C6-A; C7-A; C8-A; C9-A; HYDROCARBON-A; INTERNAL  
OLEFINIC-A; ISOMER; MOLECULAR STRUCTURE; MONOOLEFINIC-A; SINGLE STRUCTURE  
TYPE-A; STRAIGHT CHAIN-A; STRUCTURAL ISOMER; UNSATURATED CHAIN-A  
LT COMPOUNDS-A; HYDROCARBON-A; MONOHYDROXY-A; UNSATURATED-A  
LT COMPOUNDS-A; HALOHYDROCARBON-A; HYDROCARBON-A; UNSATURATED-A  
LT C13-16-A; C17-25-A; C3-A; C4-A; C5-12-A; COMPOUNDS-A; PEROXY-A  
LT 75-91-2-A; BRANCHED CHAIN-A; C4-A; C5-A; PEROXY-A; SATURATED CHAIN-A;  
SINGLE STRUCTURE TYPE-A; TERT-BUTYL HYDROPEROXIDE-A  
LT 766-07-4-A; 6 MEMBER RING-A; C6-A; CYCLOHEXYL HYDROPEROXIDE-A; PEROXY-A;  
SATURATED CARBOCYCLIC-A; SINGLE STRUCTURE TYPE-A  
LT 80-15-9-A; BENZENE RING-A; BRANCHED CHAIN-A; C9-A; CUMENE HYDROPEROXIDE-A;  
PEROXY-A; SATURATED CHAIN-A  
LT C5-12; COMPOUNDS; HYDROCARBON; HYDROCARBON SOLVENT; ORGANIC SOLVENT;  
SATURATED CHAIN; SINGLE STRUCTURE TYPE; SOLVENT; UNSATURATED; UNSATURATED  
CHAIN  
LT AROMATIC HYDROCARBON; BENZENE RING; C5-12; COMPOUNDS; HYDROCARBON;  
HYDROCARBON SOLVENT; ORGANIC SOLVENT; SOLVENT  
LT C1; C2; C3; C4; C5-12; COMPOUNDS; HALOHYDROCARBON; NONHYDROCARBON SOLVENT;  
ORGANIC SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE TYPE; SOLVENT;  
UNSATURATED; UNSATURATED CHAIN  
LT BENZENE RING; C5-12; COMPOUNDS; HALOHYDROCARBON; NONHYDROCARBON SOLVENT;  
ORGANIC SOLVENT; SOLVENT  
LT COMPOUNDS-A; OXYGEN ORGANIC-A; SILICON ORGANIC-A  
LT COMPOUNDS-A; MONOAMINE-A; MULTIAMINE-A; SILICON ORGANIC-A  
LT ELEMENT; GROUP VIA; OXYGEN  
ATM Template not available

L110 ANSWER 4 OF 18 ENCOMPPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 1998:9997 ENCOMPPAT;ENCOMPPAT2

DN 9852704

TI **Epoxidation of olefinic** compounds, e.g. propylene - by  
reaction with a hydroperoxide in the presence of a crystalline  
titano-stanno-silicate molecular sieve catalyst

IN LEWIS G J; NEMETH L; ROSIN R R

PA **UOP LLC**

PI US 5780654 19980714

AI US 1997-840531 19970422

PRAI US 1997-840531 19970422

FI US 5780654 19980714

OS DERWENT 98413159

IC C07D301-12

CC CATALYSTS/ZEOLITES; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM; ZEOLITES

CT 110-16-7-A; 110-17-8-A; 110-83-8-A; 115-07-1-A; 1344-13-4-A; 286-20-4-P;  
592-41-6-A; 67-56-1; \*75-56-9-\*P; 7722-84-1-A; 97343-62-9-P; 1-HEXENE-A; 6  
MEMBER RING-AP; ACTIVITY; AGITATING; ALKENE-A; ATE-P; C1; C12-NA; \*C3-A\*P;  
C4-AP; C6-AP; C8-A; CALCINING; CARBOXYLIC ANHYDRIDE-AP; \*CATALYST-\*P;  
CATALYST ACTIVITY; CATALYST PREPARATION; CATION; CHLORINE-A; CIS ISOMER;  
COMPOSITION; COMPOUNDS-NAP; CONCENTRATION; CRYSTAL; CYCLOHEXENE-A;  
CYCLOHEXENE OXIDE-P; DETERIORATION; DRYING; ELUTION; \*EPOXIDATION;

\*EPOXY-\*P; FUMARIC ACID-A; FUSED OR BRIDGED RING-P; GEOMETRIC ISOMER;  
GROUP IA; GROUP IVA-AP; GROUP IVB-AP; GROUP VIA-NAP; GROUP VIIA-A;  
HYDROCARBON-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; HYDROXIDE; IDE-AP;  
INORGANIC SOLVENT; INTERNAL OLEFINIC-A; ION; ISOMER; LIQUID; MALEIC  
ACID-A; MATERIALS TESTING; METAL ORGANIC-A; METHANOL; MOLECULAR SIEVE-P;  
MOLECULAR STRUCTURE; MONOAMINE; MONOCARBOXYLIC ACID-AP; MONOCARBOXYLIC  
ESTER-AP; MONOHYDROXY; MONOOLEFINIC-A; MULTICARBOXYLIC ACID-AP;  
MULTICARBOXYLIC ESTER-AP; NONHYDROCARBON SOLVENT; OLEFIN-A; OPERATING  
CONDITION; ORGANIC SALT; ORGANIC SOLVENT; \*OXIDATION REACTION; OXYGEN-AP;  
OXYGEN ORGANIC-A; PARTICLE SIZE; PEROXY-A; PHYSICAL PROPERTY; PHYSICAL  
SEPARATION; POTASSIUM; PRESSURE; PRESSURE 500 TO 800 PSIG; PREVENTION;  
PROPENE-A; \*PROPYLENE OXIDE-\*P; REACTION TIME; SATURATED CARBOCYCLIC-P;  
\*SATURATED CHAIN-NA\*P; SELECTIVITY; SILICALITE-P; SILICON-P; SILICON  
ORGANIC-A; SINGLE STRUCTURE TYPE-NAP; SOLID; SOLUTION; SOLVENT; STRAIGHT  
CHAIN-AP; SYNTHETIC ZEOLITE-P; TEMPERATURE; TEMPERATURE -10 TO 20 C;  
TEMPERATURE 20 TO 40 C; TEMPERATURE 300 TO 600 C; TEMPERATURE 40 TO 80 C;  
TEMPERATURE 80 TO 125 C; TEMPLATE; TERMINAL OLEFINIC-A; TIN-AP; TIN  
CHLORIDE-A; TITANIUM-AP; TRANS ISOMER; TRANSITION METAL-AP; UNIVERSAL OIL  
PRODUCTS; UNSATURATED-A; UNSATURATED CARBOCYCLIC-A; UNSATURATED CHAIN-A;  
US PAT; WASHING; WATER; ZEOLITE-P

LT 75-56-9-P; C3-P; EPOXY-P; PROPYLENE OXIDE-P; SATURATED CHAIN-P  
LT C6-P; EPOXY-P; SATURATED CHAIN-P; STRAIGHT CHAIN-P  
LT COMPOUNDS-P; EPOXY-P; SATURATED CARBOCYCLIC-P  
LT 286-20-4-P; 6 MEMBER RING-P; C6-P; CYCLOHEXENE OXIDE-P; EPOXY-P; FUSED OR  
BRIDGED RING-P; SATURATED CARBOCYCLIC-P; SINGLE STRUCTURE TYPE-P  
LT CARBOXYLIC ANHYDRIDE-P; COMPOUNDS-P; EPOXY-P; MONOCARBOXYLIC ACID-P;  
MONOCARBOXYLIC ESTER-P; MULTICARBOXYLIC ESTER-P  
LT C4-P; EPOXY-P; MULTICARBOXYLIC ACID-P; SATURATED CHAIN-P  
LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A  
LT 115-07-1-A; C3-A; HYDROCARBON-A; MONOOLEFINIC-A; PROPENE-A; SINGLE  
STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A  
LT COMPOUNDS-A; PEROXY-A  
LT 97343-62-9-P; ATE-P; CATALYST-P; CRYSTAL; GROUP IVA-P; GROUP IVB-P; GROUP  
VIA-P; IDE-P; MOLECULAR SIEVE-P; OXYGEN-P; SILICALITE-P; SILICON-P;  
SYNTHETIC ZEOLITE-P; TIN-P; TITANIUM-P; TRANSITION METAL-P; ZEOLITE-P  
LT ALKENE-A; COMPOUNDS-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE STRUCTURE  
TYPE-A; UNSATURATED CHAIN-A  
LT COMPOUNDS-A; HYDROCARBON-A; MONOOLEFINIC-A; UNSATURATED CARBOCYCLIC-A  
LT 592-41-6-A; 1-HEXENE-A; C6-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE  
STRUCTURE TYPE-A; STRAIGHT CHAIN-A; TERMINAL OLEFINIC-A; UNSATURATED  
CHAIN-A  
LT 110-83-8-A; 6 MEMBER RING-A; C6-A; CYCLOHEXENE-A; HYDROCARBON-A;  
MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; UNSATURATED CARBOCYCLIC-A  
LT COMPOUNDS-A; MONOCARBOXYLIC ACID-A  
LT CARBOXYLIC ANHYDRIDE-A; COMPOUNDS-A; MONOCARBOXYLIC ACID-A;  
MULTICARBOXYLIC ACID-A  
LT COMPOUNDS-A; MONOCARBOXYLIC ESTER-A; MULTICARBOXYLIC ESTER-A  
LT 110-16-7-A; C4-A; CIS ISOMER; GEOMETRIC ISOMER; INTERNAL OLEFINIC-A;  
ISOMER; MALEIC ACID-A; MOLECULAR STRUCTURE; MONOOLEFINIC-A;  
MULTICARBOXYLIC ACID-A; SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A;  
UNSATURATED CHAIN-A  
LT 110-17-8-A; C4-A; FUMARIC ACID-A; GEOMETRIC ISOMER; INTERNAL OLEFINIC-A;  
ISOMER; MOLECULAR STRUCTURE; MONOOLEFINIC-A; MULTICARBOXYLIC ACID-A;  
SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A; TRANS ISOMER; UNSATURATED  
CHAIN-A  
LT CIS ISOMER; COMPOUNDS-A; GEOMETRIC ISOMER; INTERNAL OLEFINIC-A; ISOMER;  
MOLECULAR STRUCTURE; MONOCARBOXYLIC ACID-A; MONOCARBOXYLIC ESTER-A;  
MULTICARBOXYLIC ESTER-A; STRAIGHT CHAIN-A; TRANS ISOMER; UNSATURATED-A;  
UNSATURATED CHAIN-A  
LT 67-56-1; C1; METHANOL; MONOHYDROXY; NONHYDROCARBON SOLVENT; ORGANIC

SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE TYPE; SOLVENT  
LT INORGANIC SOLVENT; SOLVENT; WATER  
LT 7722-84-1-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-A; OXYGEN-A  
LT COMPOUNDS; GROUP IA; POTASSIUM  
LT C12; GROUP VIA; HYDROXIDE; MONOAMINE; ORGANIC SALT; SATURATED CHAIN;  
SINGLE STRUCTURE TYPE; TEMPLATE  
LT C8-A; OXYGEN ORGANIC-A; SATURATED CHAIN-A; SILICON ORGANIC-A; SINGLE  
STRUCTURE TYPE-A  
LT C12-A; GROUP IVB-A; METAL ORGANIC-A; OXYGEN ORGANIC-A; SATURATED CHAIN-A;  
SINGLE STRUCTURE TYPE-A; TITANIUM-A; TRANSITION METAL-A  
LT 1344-13-4-A; CHLORINE-A; GROUP IVA-A; GROUP VIIA-A; IDE-A; TIN-A; TIN  
CHLORIDE-A  
ATM Template not available

L110 ANSWER 5 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 1998:7388 ENCOMPAT;ENCOMPAT2

DN 9851915

TI **Olefin epoxidation** - comprises reacting an  
**olefin** compound with hydrogen peroxide in the presence of a  
titano-vanado-silicalite catalyst

IN LEWIS G J; NEMETH L T; ROSIN R R

PA **UOP LLC**

PI US 5744619 19980428

AI US 1997-818265 19970317

PRAI US 1997-818265 19970317

FI US 5744619 19980428

OS DERWENT 98271144

IC C07D301-03

CC CATALYSTS/ZEOLITES; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM

CT 107-18-6-A; 110-16-7-A; 110-17-8-A; 110-83-8-A; 115-07-1-A; 286-20-4-P;  
75-56-9-P; 7722-84-1-A; 6 MEMBER RING-AP; ADDITIVE; ALKENE-A; ALLYL  
ALCOHOL-A; ATE; BENZENE RING-AP; C3-AP; C4-AP; C6-AP; CARBOXYLIC  
ANHYDRIDE-AP; \*CATALYST; CATION; CIS ISOMER; COMPOSITION; COMPOUNDS-NAP;  
CONCENTRATION; CRYSTAL; CYCLOHEXENE-A; CYCLOHEXENE OXIDE-P; EFFICIENCY;  
\*EPOXIDATION; \*EPOXY-\*P; ETHER-AP; FUMARIC ACID-A; FUSED OR BRIDGED  
RING-P; GEOMETRIC ISOMER; GROUP IA; GROUP IVA; GROUP IVB; GROUP VB; GROUP  
VIA-NA; HALOGEN ORGANIC-AP; HALOHYDROCARBON-A; HYDROCARBON-A; HYDROGEN-A;  
HYDROGEN PEROXIDE-A; IDE-NA; INTERNAL OLEFINIC-A; ION; ISOMER; KETONE-AP;  
MALEIC ACID-A; MARKUSH STRUCTURE; MOLECULAR SIEVE; MOLECULAR STRUCTURE;  
MONOAMINE-AP; MONOCARBOXYLIC ACID-AP; MONOCARBOXYLIC ESTER-AP;  
MONOHYDROXY-AP; MONOOLEFINIC-A; MULTIAMINE-AP; MULTICARBOXYLIC ACID-AP;  
MULTICARBOXYLIC ESTER-AP; MULTIHYDROXY-AP; NITRILE-AP; NITRO-AP; OLEFIN-A;  
OPERATING CONDITION; ORGANIC SOLVENT; OTHER OXYGEN ESTER-AP; \*OXIDATION  
REACTION; OXYGEN-NA; OXYGEN ORGANIC-AP; PARTICLE; PARTICLE SIZE; PHYSICAL  
PROPERTY; POTASSIUM; PROPENE-A; PROPYLENE OXIDE-P; SATURATED  
CARBOCYCLIC-AP; SATURATED CHAIN-P; SELECTIVITY; SILICON; SINGLE STRUCTURE  
TYPE-AP; SOLVENT; STRAIGHT CHAIN-A; SULFONIC ACID-AP; SULFUR CONTAINING  
ACID-AP; SULFUR CONTAINING ESTER-AP; SULFUR ORGANIC-AP; TEMPERATURE;  
TEMPERATURE -10 TO 20 C; TEMPERATURE 20 TO 40 C; TEMPERATURE 40 TO 80 C;  
TEMPERATURE 80 TO 125 C; TERMINAL OLEFINIC-A; TITANIUM; TRANS ISOMER;  
TRANSITION METAL; UNIVERSAL OIL PRODUCTS; UNSATURATED-A; UNSATURATED  
CARBOCYCLIC-A; UNSATURATED CHAIN-A; US PAT; VANADIUM; YIELD

LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A

LT 7722-84-1-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-A; OXYGEN-A

LT ATE; CATALYST; CRYSTAL; GROUP IVA; GROUP IVB; GROUP VIA; GROUP IDE;  
MOLECULAR SIEVE; OXYGEN; PARTICLE; SILICON; TITANIUM; TRANSITION METAL;  
VANADIUM

LT COMPOUNDS-P; EPOXY-P

LT BENZENE RING-A; CARBOXYLIC ANHYDRIDE-A; COMPOUNDS-A; ETHER-A; HALOGEN ORGANIC-A; HALOHYDROCARBON-A; HYDROCARBON-A; INTERNAL OLEFINIC-A; KETONE-A; MARKUSH STRUCTURE; MONOAMINE-A; MONOCARBOXYLIC ACID-A; MONOCARBOXYLIC ESTER-A; MONOHYDROXY-A; MONOOLEFINIC-A; MULTIAMINE-A; MULTICARBOXYLIC ACID-A; MULTICARBOXYLIC ESTER-A; MULTIHYDROXY-A; NITRILE-A; NITRO-A; OTHER OXYGEN ESTER-A; OXYGEN ORGANIC-A; SATURATED CARBOCYCLIC-A; SULFONIC ACID-A; SULFUR CONTAINING ACID-A; SULFUR CONTAINING ESTER-A; SULFUR ORGANIC-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A

LT BENZENE RING-P; CARBOXYLIC ANHYDRIDE-P; COMPOUNDS-P; EPOXY-P; ETHER-P; HALOGEN ORGANIC-P; KETONE-P; MARKUSH STRUCTURE; MONOAMINE-P; MONOCARBOXYLIC ACID-P; MONOCARBOXYLIC ESTER-P; MONOHYDROXY-P; MULTIAMINE-P; MULTICARBOXYLIC ACID-P; MULTICARBOXYLIC ESTER-P; MULTIHYDROXY-P; NITRILE-P; NITRO-P; OTHER OXYGEN ESTER-P; OXYGEN ORGANIC-P; SATURATED CARBOCYCLIC-P; SATURATED CHAIN-P; SULFONIC ACID-P; SULFUR CONTAINING ACID-P; SULFUR CONTAINING ESTER-P; SULFUR ORGANIC-P

LT ALKENE-A; COMPOUNDS-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; UNSATURATED CHAIN-A

LT 115-07-1-A; C3-A; HYDROCARBON-A; MONOOLEFINIC-A; PROPENE-A; SINGLE STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A

LT COMPOUNDS-A; HYDROCARBON-A; UNSATURATED CARBOCYCLIC-A

LT 110-83-8-A; 6 MEMBER RING-A; C6-A; CYCLOHEXENE-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; UNSATURATED CARBOCYCLIC-A

LT 107-18-6-A; ALLYL ALCOHOL-A; C3-A; MONOHYDROXY-A; MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A

LT 110-16-7-A; C4-A; CIS ISOMER; GEOMETRIC ISOMER; INTERNAL OLEFINIC-A; ISOMER; MALEIC ACID-A; MOLECULAR STRUCTURE; MONOOLEFINIC-A; MULTICARBOXYLIC ACID-A; SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A; UNSATURATED CHAIN-A

LT 110-17-8-A; C4-A; FUMARIC ACID-A; GEOMETRIC ISOMER; INTERNAL OLEFINIC-A; ISOMER; MOLECULAR STRUCTURE; MONOOLEFINIC-A; MULTICARBOXYLIC ACID-A; SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A; TRANS ISOMER; UNSATURATED CHAIN-A

LT COMPOUNDS-A; INTERNAL OLEFINIC-A; MONOCARBOXYLIC ESTER-A; MULTICARBOXYLIC ESTER-A; STRAIGHT CHAIN-A; UNSATURATED CHAIN-A

LT COMPOUNDS-P; EPOXY-P; SATURATED CHAIN-P

LT 75-56-9-P; C3-P; EPOXY-P; PROPYLENE OXIDE-P; SATURATED CHAIN-P

LT COMPOUNDS-P; EPOXY-P; FUSED OR BRIDGED RING-P; SATURATED CARBOCYCLIC-P

LT 286-20-4-P; 6 MEMBER RING-P; C6-P; CYCLOHEXENE OXIDE-P; EPOXY-P; FUSED OR BRIDGED RING-P; SATURATED CARBOCYCLIC-P; SINGLE STRUCTURE TYPE-P

LT C3-P; EPOXY-P; MONOHYDROXY-P; SATURATED CHAIN-P

LT C4-P; EPOXY-P; MULTICARBOXYLIC ACID-P; SATURATED CHAIN-P; SINGLE STRUCTURE TYPE-P

LT COMPOUNDS-P; EPOXY-P; MONOCARBOXYLIC ESTER-P; MULTICARBOXYLIC ESTER-P; SATURATED CHAIN-P

LT COMPOUNDS; GROUP IA; POTASSIUM

ATM Template not available

L110 ANSWER 6 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING INFORMATION INC. on STN

AN 97:13783 ENCOMPAT;ENCOMPAT2

DN 9753532

TI **Epoxidising olefin** - by contacting with hydrogen peroxide in presence of crystalline siliceous molecular sieve zeolite **catalyst** having niobium

IN SAXTON R J; ZAJACEK J G

PA ARCO CHEM TECHNOLOGY LP

PI US 5679749 19971021

AI US 1995-565711 19951130

US 1997-779144 19970103

PRAI US 1997-779144 19970103  
US 1995-565711 19951130  
FI US 5679749 19971021  
OS DERWENT 97525751  
IC C08F008-08  
CC CATALYSTS/ZEOLITES; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM; ZEOLITES  
CT \*115-07-1-A; \*75-56-9-P; 7722-84-1-A; 9002-84-0; ACTIVITY; AGITATING;  
ALUMINUM-P; ALUMINUM SILICATES-P; ANHYDROUS; ATE-P; ATLANTIC RICHFIELD;  
C12-A; C2-A; C2 MONOMER; \*C3-A\*P; C4-A; C5-12-A; CALCINING;  
\*CATALYST-P; CATALYST ACTIVITY; CATION; COMPOSITION;  
COMPOUNDS-AP; CRYSTAL; DRY; DRYING; ELEMENT; \*EPOXIDATION; \*EPOXY-P;  
FILTRATION; FLUOROHYDROCARBON; GROUP IIIA-P; GROUP IVA-P; GROUP  
VA; GROUP VB-P; GROUP VIA-AP; HALOHYDROCARBON; HEATING; HIGH TEMPERATURE;  
HOMOPOLYMER; \*HYDROCARBON-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; HYDROLYSIS;  
HYDROXIDE-A; IDE-AP; ION; ION EXCHANGE; LABORATORY BOMB; LINER; MIXTURE;  
MOLECULAR SIEVE-P; MOLECULAR STRUCTURE; MONOAMINE-A; \*MONOOLEFINIC-A;  
MONOOLEFINIC MONOMER; NIOBIUM-P; NITROGEN; OLEFIN-A; OPERATING CONDITION;  
OPTICAL DENSITY; OPTICAL PROPERTY; ORGANIC SALT-A; \*OXIDATION REACTION;  
OXYGEN-AP; PHYSICAL PROPERTY; PHYSICAL SEPARATION; \*PROPENE-A; \*PROPYLENE  
OXIDE-P; REACTOR; RECLAIMING; \*SATURATED CHAIN-A\*P; SELECTIVITY;  
SILICON-P; \*SINGLE STRUCTURE TYPE-N\*A; SOLID; SOLUTION; SOLVOLYSIS;  
SPARGING; STEAMING; SYNTHETIC RESIN; SYNTHETIC ZEOLITE-P; TEFLON;  
TEMPERATURE; TEMPERATURE 125 TO 200 C; TEMPERATURE 20 TO 40 C; TEMPERATURE  
300 TO 600 C; TEMPERATURE 40 TO 80 C; TEMPERATURE 80 TO 125 C; \*TERMINAL  
OLEFINIC-A; TERMINAL OLEFINIC MONOMER; TETRAFLUOROETHYLENE HOMOPOLYMER;  
TRANSITION METAL-P; TURBIDITY; UNSATURATED-A; \*UNSATURATED CHAIN-A;  
UNSATURATED CHAIN MONOMER; US PAT; WASHING; WATER CONTENT; ZEOLITE-P; ZSM  
ZEOLITE-P; ZSM-5 ZEOLITE-P  
LT C2-A; C3-A; C4-A; C5-12-A; COMPOUNDS-A; HYDROCARBON-A; MONOOLEFINIC-A;  
OLEFIN-A; UNSATURATED-A  
LT 7722-84-1-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-A; OXYGEN-A  
LT ALUMINUM-P; ALUMINUM SILICATES-P; ATE-P; CATALYST-P; CRYSTAL; GROUP  
IIIA-P; GROUP IVA-P; GROUP VB-P; GROUP VIA-P; IDE-P; MOLECULAR SIEVE-P;  
MOLECULAR STRUCTURE; NIOBIUM-P; OXYGEN-P; SILICON-P; SYNTHETIC ZEOLITE-P;  
TRANSITION METAL-P; ZEOLITE-P; ZSM ZEOLITE-P; ZSM-5 ZEOLITE-P  
LT 115-07-1-A; C3-A; HYDROCARBON-A; MONOOLEFINIC-A; PROPENE-A; SINGLE  
STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A  
LT COMPOUNDS-P; EPOXY-P  
LT 75-56-9-P; C3-P; EPOXY-P; PROPYLENE OXIDE-P; SATURATED CHAIN-P  
LT C12-A; GROUP VIA-A; HYDROXIDE-A; MONOAMINE-A; ORGANIC SALT-A; SATURATED  
CHAIN-A; SINGLE STRUCTURE TYPE-A  
LT ELEMENT; GROUP VA; NITROGEN  
LT 9002-84-0; C2 MONOMER; FLUOROHYDROCARBON; HALOHYDROCARBON; HOMOPOLYMER;  
LINER; MONOOLEFINIC MONOMER; SINGLE STRUCTURE TYPE; SYNTHETIC RESIN;  
TEFLON; TERMINAL OLEFINIC MONOMER; TETRAFLUOROETHYLENE HOMOPOLYMER;  
UNSATURATED CHAIN MONOMER  
ATM Template not available  
  
L110 ANSWER 7 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN  
AN 97:4269 ENCOMPAT;ENCOMPAT2  
DN 9715286  
TI Prodn. of propylene oxide from hydrogen and carbon oxide(s) - by  
oxygenation and olefin conversion to propylene, epoxidn  
. with aq. hydrogen peroxide obtd. from hydrogen produced from feedstream  
IN PUJADO P R; VORA B V  
PA UOP  
PI US 5599955 970204  
AI US 1996-605602 960222

PRAI US 1996-605602 960222  
FI US 5599955 970204  
OS DERWENT 97118343  
IC C07D301-14; C07D301-16  
CC CHEMICAL PRODUCTS; OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM;  
PETROLEUM SUBSTITUTES; SYNTHESIS GAS  
CT 115-07-1-A; 115-10-6; 12795-06-1-A; 64-17-5; 67-56-1; 71-23-8; 74-85-1;  
\*75-56-9-\*P; 7631-86-9; 7722-84-1-A; 6 MEMBER RING; ACTIVATED CHARCOAL;  
ACTIVATION; ADSORBENT; \*ADSORPTION PROCESS; ALKENE; ALUMINUM; ATE; BENZENE  
RING; BUTENES; BYPRODUCT; C1; C2; \*C3-NA\*P; C4; CARBON-A; CARBON OXIDE-A;  
\*CATALYST; CHARCOAL; CHROMIUM; COLLOID/DISPERSION; COMMERCIAL;  
COMPOUNDS-NA; CYCLIC-REGENERATIVE; DISTILLATION; EFFICIENCY; ELEMENT-A;  
ENERGY REQUIREMENT; \*EPOXIDATION; \*EPOXY-\*P; ETHER; ETHYL ALCOHOL;  
ETHYLENE; FEEDSTOCK; FUSED OR BRIDGED RING; GEL; GROUP IIIA; GROUP IVA-NA;  
GROUP IVB; GROUP VA; GROUP VIA-NA; GROUP VIB; HYDROCARBON-NA; HYDROGEN-A;  
HYDROGEN PEROXIDE-A; IDE-NA; KETONE; LOW MOLECULAR WEIGHT; MANUFACTURED  
GAS-A; MEMBRANE; METHANOL; METHYL ETHER; MOLECULAR WEIGHT; MOLYBDENUM;  
MONOHYDROXY; MONOOLEFINIC-NA; MULTIOLEFINIC; OLEFIN-A; OPERATING  
CONDITION; \*OXIDATION REACTION; OXYGEN-NA; PHOSPHORUS; PHYSICAL PROPERTY;  
\*PHYSICAL SEPARATION; PRESSURE; PRESSURE 300 TO 500 PSIG; PRESSURE 500 TO  
800 PSIG; PROCESS STREAM; PROPENE-A; PROPYL ALCOHOL; \*PROPYLENE OXIDE-\*P;  
RECYCLING; REGENERATION; SATURATED CARBOCYCLIC; \*SATURATED CHAIN-N\*P;  
SILICA; SILICOALUMINOPHOSPHATES; SILICON; SINGLE STRUCTURE TYPE-NA;  
SORBENT; \*SORPTION PROCESS; SYNTHESIS GAS-A; TEMPERATURE; TEMPERATURE -10  
TO 20 C; TEMPERATURE 20 TO 40 C; TEMPERATURE 40 TO 80 C; TEMPERATURE 80 TO  
125 C; TERMINAL OLEFINIC-NA; TITANIUM; TRANSITION METAL; TUNGSTEN;  
UNIVERSAL OIL PRODUCTS; UNSATURATED-A; UNSATURATED CARBOCYCLIC;  
UNSATURATED CHAIN-NA; US PAT; VAPORIZER; WASTE MATERIAL; WASTE WATER;  
WATER; WATER TREATING  
LT ALUMINUM; ATE; CATALYST; CHROMIUM; GROUP IIIA; GROUP VA; GROUP VIA; GROUP  
VIB; OXYGEN; PHOSPHORUS; TRANSITION METAL  
LT ALUMINUM; ATE; CATALYST; GROUP IIIA; GROUP IVB; GROUP VA; GROUP VIA;  
OXYGEN; PHOSPHORUS; TITANIUM; TRANSITION METAL  
LT ALUMINUM; ATE; CATALYST; CHROMIUM; GROUP IIIA; GROUP IVB; GROUP VA; GROUP  
VIA; GROUP VIB; MOLYBDENUM; OXYGEN; PHOSPHORUS; TITANIUM; TRANSITION  
METAL; TUNGSTEN  
LT COMPOUNDS; HYDROCARBON  
LT 64-17-5; 67-56-1; 71-23-8; C1; C2; C3; ETHYL ALCOHOL; METHANOL;  
MONOHYDROXY; PROPYL ALCOHOL; SATURATED CHAIN; SINGLE STRUCTURE TYPE  
LT 115-10-6; C2; ETHER; METHYL ETHER; SATURATED CHAIN; SINGLE STRUCTURE TYPE  
LT ALUMINUM; ATE; CATALYST; GROUP IIIA; GROUP IVA; GROUP VA; GROUP VIA; IDE;  
OXYGEN; PHOSPHORUS; SILICOALUMINOPHOSPHATES; SILICON  
LT 6 MEMBER RING; BENZENE RING; COMPOUNDS; FUSED OR BRIDGED RING; KETONE;  
MONOOLEFINIC; MULTIOLEFINIC; SATURATED CARBOCYCLIC; SATURATED CHAIN;  
UNSATURATED CARBOCYCLIC  
LT 6 MEMBER RING; BENZENE RING; COMPOUNDS; FUSED OR BRIDGED RING; KETONE;  
SATURATED CARBOCYCLIC; SATURATED CHAIN  
LT 74-85-1; C2; ETHYLENE; HYDROCARBON; MONOOLEFINIC; SINGLE STRUCTURE TYPE;  
TERMINAL OLEFINIC; UNSATURATED CHAIN  
LT ALKENE; BUTENES; C4; COMPOUNDS; HYDROCARBON; MONOOLEFINIC; SINGLE  
STRUCTURE TYPE; UNSATURATED CHAIN  
LT 7631-86-9; ADSORBENT; GROUP IVA; GROUP VIA; IDE; OXYGEN; SILICA; SILICON;  
SORBENT  
LT ACTIVATED CHARCOAL; ADSORBENT; CHARCOAL; SORBENT  
LT ADSORBENT; ATE; COMPOUNDS; GROUP IVA; GROUP VIA; OXYGEN; SILICON; SORBENT  
LT 75-56-9-P; C3-P; EPOXY-P; PROPYLENE OXIDE-P; SATURATED CHAIN-P  
LT ELEMENT-A; HYDROGEN-A  
LT 12795-06-1-A; CARBON-A; CARBON OXIDE-A; GROUP IVA-A; GROUP VIA-A; IDE-A;  
OXYGEN-A  
LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A



LT 115-07-1-A; C3-A; HYDROCARBON-A; MONOOLEFINIC-A; PROPENE-A; SINGLE  
STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A  
LT 7722-84-1-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-A; OXYGEN-A  
LT ALUMINUM; ATE; CATALYST; GROUP IIIA; GROUP VA; GROUP VIA; GROUP VIB;  
MOLYBDENUM; OXYGEN; PHOSPHORUS; TRANSITION METAL  
LT ALUMINUM; ATE; CATALYST; GROUP IIIA; GROUP VA; GROUP VIA; GROUP VIB;  
OXYGEN; PHOSPHORUS; TRANSITION METAL; TUNGSTEN  
ATM Template not available

L110 ANSWER 8 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 96:1608 ENCOMPAT;ENCOMPAT2

DN 9650762

TI **Epoxidation of olefinic** double bonds - comprises  
reacting with hydroperoxide in presence of titania and titano-silicate  
catalysts, useful for producing, e.g. propylene oxide

IN JONES R R; MALLOY T P; NEMETH L T

PA **UOP**

PI US 5466835 951114

AI US 1993-172314 931223

US 1994-239801 940509

PRAI US 1994-239801 940509

US 1993-172314 931223

FI US 5466835 951114

OS DERWENT 96048529

IC C07D301-12; C07D301-14; C07D301-19; C07D303-04

CC CATALYSTS/ZEOLITES; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM

CT 107-18-6-A; 110-16-7-A; 110-17-8-A; 110-83-8-A; \*115-07-1-\*A;  
13463-67-7-P; 286-20-4-P; 5593-70-4-A; 67-56-1; 67-63-0; \*75-56-9-\*P;  
7722-84-1-A; 6 MEMBER RING-AP; ACTIVATION; ACTIVITY; AGITATING; AIR;  
ALKENE-A; ALLYL ALCOHOL-A; ATE-P; AUTOCLAVE; C1; C12-A; C13-16-A;  
\*C3-N\*A\*P; C4-AP; C6-AP; C8-A; CALCINING; CARBOXYLIC ANHYDRIDE-A;  
\*CATALYST-\*P; CATALYST ACTIVITY; CENTRIFUGING; CIS ISOMER;  
COLLOID/DISPERSION; COLOR; COMPOSITION; COMPOUNDS-AP; CONCENTRATION;  
CONTROL; COOLING; COST; CRYSTALLIZATION; CYCLOHEXENE-A; CYCLOHEXENE  
OXIDE-P; DISTILLATION; DROP; DRYING; ECONOMIC FACTOR; EFFICIENCY; ELEMENT;  
\*EPOXIDATION; \*EPOXY-\*P; FUMARIC ACID-A; FUSED OR BRIDGED RING-P; GEL;  
GELATION; GEOMETRIC ISOMER; GROUP IVA-P; GROUP IVB-AP; GROUP VA; GROUP  
VIA-AP; HEATING EQUIPMENT; \*HYDROCARBON-\*A; HYDROGEN-A; HYDROGEN  
PEROXIDE-A; HYDROXIDE-A; IDE-AP; IMPREGNATING; INORGANIC SOLVENT; INSIDE;  
INTERNAL OLEFINIC-A; ISOMER; ISOPROPYL ALCOHOL; LABORATORY BOMB; LIQUEFIED  
GAS; LIQUID; MALEIC ACID-A; METAL ORGANIC-A; METHANOL; MIXING; MIXTURE;  
MOLECULAR STRUCTURE; MONOAMINE-A; MONOCARBOXYLIC ACID-A; MONOCARBOXYLIC  
ESTER-A; MONOHYDROXY-NAP; \*MONOOLEFINIC-\*A; MULTICARBOXYLIC ACID-AP;  
MULTICARBOXYLIC ESTER-A; NITROGEN; NONHYDROCARBON SOLVENT; OLEFIN-A;  
OPERATING CONDITION; OPTICAL DENSITY; OPTICAL PROPERTY; ORGANIC SALT-A;  
ORGANIC SOLVENT; \*OXIDATION REACTION; OXYGEN-AP; OXYGEN ORGANIC-A;  
PARTICLE; PARTICLE SIZE; PEROXY-A; PHASE CHANGE; PHYSICAL PROPERTY;  
PHYSICAL SEPARATION; PRESSURE; PRESSURE 150 TO 300 PSIG; PRESSURE 500 TO  
800 PSIG; PRIOR TREATMENT; \*PROPENE-\*A; \*PROPYLENE OXIDE-\*P; REACTION  
TIME; REGENERATION; SATURATED CARBOCYCLIC-P; \*SATURATED CHAIN-NA\*P;  
SELECTIVITY; SILICON-P; SILICON ORGANIC-A; \*SINGLE STRUCTURE TYPE-N\*AP;  
SOLID; SOLIDIFICATION; SOLUTION; SOLVENT; STEAMING; STRAIGHT CHAIN-A;  
TEMPERATURE; TEMPERATURE -10 TO 20 C; TEMPERATURE 125 TO 200 C;  
TEMPERATURE 20 TO 40 C; TEMPERATURE 300 TO 600 C; TEMPERATURE 40 TO 80 C;  
TEMPERATURE 80 TO 125 C; TEMPLATE-A; \*TERMINAL OLEFINIC-\*A; TETRABUTYL  
TITANATE-A; TITANIUM-AP; TITANIUM OXIDE-P; TRANS ISOMER; TURBIDITY;  
UNIVERSAL OIL PRODUCTS; UNSATURATED-A; UNSATURATED CARBOCYCLIC-A;  
\*UNSATURATED CHAIN-\*A; US PAT; \*USE-NA\*P; WASHING; WATER; YIELD

LT 67-56-1; C1; METHANOL; MONOHYDROXY; NONHYDROCARBON SOLVENT; ORGANIC  
SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE TYPE; SOLVENT; USE  
LT ELEMENT; GROUP VA; NITROGEN  
LT INSIDE; LABORATORY BOMB  
LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A  
LT COMPOUNDS-P; EPOXY-P  
LT COMPOUNDS-A; PEROXY-A  
LT 13463-67-7-P; CATALYST-P; GROUP IVB-P; GROUP VIA-P; IDE-P; OXYGEN-P;  
PARTICLE; TITANIUM-P; TITANIUM OXIDE-P; USE-P  
LT ATE-P; CATALYST-P; GROUP IVA-P; GROUP IVB-P; GROUP VIA-P; OXYGEN-P;  
PARTICLE; SILICON-P; TITANIUM-P; USE-P  
LT 75-56-9-P; C3-P; EPOXY-P; PROPYLENE OXIDE-P; SATURATED CHAIN-P  
LT 115-07-1-A; C3-A; HYDROCARBON-A; MONOOLEFINIC-A; PROPENE-A; SINGLE  
STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A  
LT ALKENE-A; COMPOUNDS-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE STRUCTURE  
TYPE-A; UNSATURATED CHAIN-A  
LT COMPOUNDS-A; HYDROCARBON-A; UNSATURATED-A; UNSATURATED CARBOCYCLIC-A  
LT 110-83-8-A; 6 MEMBER RING-A; C6-A; CYCLOHEXENE-A; HYDROCARBON-A;  
MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; UNSATURATED CARBOCYCLIC-A  
LT 286-20-4-P; 6 MEMBER RING-P; C6-P; CYCLOHEXENE OXIDE-P; EPOXY-P; FUSED OR  
BRIDGED RING-P; SATURATED CARBOCYCLIC-P; SINGLE STRUCTURE TYPE-P  
LT COMPOUNDS-A; MONOHYDROXY-A  
LT 107-18-6-A; ALLYL ALCOHOL-A; C3-A; MONOHYDROXY-A; MONOOLEFINIC-A; SINGLE  
STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A  
LT CARBOXYLIC ANHYDRIDE-A; COMPOUNDS-A; MONOCARBOXYLIC ACID-A;  
MULTICARBOXYLIC ACID-A  
LT COMPOUNDS-A; MONOCARBOXYLIC ESTER-A; MULTICARBOXYLIC ESTER-A  
LT 110-16-7-A; C4-A; CIS ISOMER; GEOMETRIC ISOMER; INTERNAL OLEFINIC-A;  
ISOMER; MALEIC ACID-A; MOLECULAR STRUCTURE; MONOOLEFINIC-A;  
MULTICARBOXYLIC ACID-A; SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A;  
UNSATURATED CHAIN-A  
LT 110-17-8-A; C4-A; FUMARIC ACID-A; GEOMETRIC ISOMER; INTERNAL OLEFINIC-A;  
ISOMER; MOLECULAR STRUCTURE; MONOOLEFINIC-A; MULTICARBOXYLIC ACID-A;  
SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A; TRANS ISOMER; UNSATURATED  
CHAIN-A  
LT C3-P; EPOXY-P; MONOHYDROXY-P; SATURATED CHAIN-P  
LT C4-P; CIS ISOMER; EPOXY-P; GEOMETRIC ISOMER; ISOMER; MOLECULAR STRUCTURE;  
MULTICARBOXYLIC ACID-P; TRANS ISOMER  
LT 7722-84-1-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-A; OXYGEN-A  
LT C8-A; OXYGEN ORGANIC-A; SATURATED CHAIN-A; SILICON ORGANIC-A; SINGLE  
STRUCTURE TYPE-A  
LT INORGANIC SOLVENT; SOLVENT; USE; WATER  
LT 67-63-0; C3; DROP; ISOPROPYL ALCOHOL; MONOHYDROXY; NONHYDROCARBON SOLVENT;  
ORGANIC SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE TYPE; SOLVENT; USE  
LT C12-A; GROUP VIA-A; HYDROXIDE-A; MONOAMINE-A; ORGANIC SALT-A; SATURATED  
CHAIN-A; SINGLE STRUCTURE TYPE-A; TEMPLATE-A; USE-A  
LT 5593-70-4-A; C13-16-A; GROUP IVB-A; METAL ORGANIC-A; OXYGEN ORGANIC-A;  
SATURATED CHAIN-A; SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A; TETRABUTYL  
TITANATE-A; TITANIUM-A  
LT DISTILLATION; PHYSICAL SEPARATION; PRIOR TREATMENT  
ATM Template not available

L110 ANSWER 9 OF 18 ENCOMPPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 94:12426 ENCOMPPAT;ENCOMPPAT2

DN 9455047

TI **Epoxidation of olefins** in high yield with good  
selectivity - using aq. soln. of hydrogen peroxide in presence of  
titania-supported titanasilicate catalyst

IN JONES R R; MALLOY T P; NEMETH L T

PA UOP  
PI US 5354875 941011  
AI US 1993-172314 931223  
PRAI US 1993-172314 931223  
FI US 5354875 941011  
OS DERWENT 94324610  
IC C07D301-12; C07D301-14; C07D301-19; C07D303-04  
CC CATALYSTS/ZEOLITES; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM; ZEOLITES  
CT 107-18-6-A; 110-16-7-A; 110-17-8-A; 110-83-8-A; \*115-07-1-\*P; 13463-67-7;  
286-20-4-P; 67-56-1; \*75-56-9-\*P; 7722-84-1-A; 6 MEMBER RING-AP; ALKENE-A;  
ALLYL ALCOHOL-A; ATE; C1; \*C3-A\*P; C4-AP; C6-AP; CARBOXYLIC ANHYDRIDE-A;  
\*CATALYST; CATALYST SUPPORT; CIS ISOMER; COMPOSITION; COMPOUNDS-AP;  
CONCENTRATION; CRYSTALLIZATION; CYCLOHEXENE-A; CYCLOHEXENE OXIDE-P;  
DILUTE; ELEMENT; \*EPOXIDATION; \*EPOXY-\*P; FUMARIC ACID-A; FUSED OR BRIDGED  
RING-P; GEOMETRIC ISOMER; GROUP IVA; GROUP IVB; GROUP VA; GROUP VIA-NA;  
HEATING; \*HYDROCARBON-A\*P; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-NA;  
INORGANIC SOLVENT; INTERNAL OLEFINIC-A; ISOMER; LIQUEFIED GAS; LIQUID;  
MALEIC ACID-A; METHANOL; MOLECULAR STRUCTURE; MONOCARBOXYLIC ACID-A;  
MONOCARBOXYLIC ESTER-AP; MONOHYDROXY-NAP; \*MONOOLEFINIC-A\*P;  
MULTICARBOXYLIC ACID-AP; MULTICARBOXYLIC ESTER-AP; NITROGEN;  
NONHYDROCARBON SOLVENT; OLEFIN-A; OPERATING CONDITION; ORGANIC SOLVENT;  
\*OXIDATION REACTION; OXYGEN-NA; PARTICLE; PHASE CHANGE; PHYSICAL PROPERTY;  
PRESSURE; PRESSURE 500 TO 800 PSIG; \*PROPENE-\*P; \*PROPYLENE OXIDE-\*P;  
RECOVERY; SATURATED CARBOCYCLIC-P; \*SATURATED CHAIN-N\*P; SELECTIVITY;  
SILICON; \*SINGLE STRUCTURE TYPE-NA\*P; SOLIDIFICATION; SOLUTION; SOLVENT;  
STEAMING; STRAIGHT CHAIN-A; TEMPERATURE; TEMPERATURE -10 TO 20 C;  
TEMPERATURE 20 TO 40 C; TEMPERATURE 40 TO 80 C; TEMPERATURE 80 TO 125 C;  
\*TERMINAL OLEFINIC-A\*P; TITANIUM; TITANIUM OXIDE; TRANS ISOMER; UNIVERSAL  
OIL PRODUCTS; UNSATURATED-A; UNSATURATED CARBOCYCLIC-A; \*UNSATURATED  
CHAIN-A\*P; US PAT; \*USE; WATER; YIELD  
LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A  
LT INORGANIC SOLVENT; SOLVENT; USE; WATER  
LT 7722-84-1-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-A; OXYGEN-A  
LT COMPOUNDS-P; EPOXY-P; SATURATED CHAIN-P  
LT 13463-67-7; ATE; CATALYST; GROUP IVA; GROUP IVB; GROUP VIA; IDE; OXYGEN;  
PARTICLE; SILICON; TITANIUM; TITANIUM OXIDE; USE  
LT 13463-67-7; CATALYST SUPPORT; GROUP IVB; GROUP VIA; IDE; OXYGEN; TITANIUM;  
TITANIUM OXIDE; USE  
LT ALKENE-A; COMPOUNDS-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE STRUCTURE  
TYPE-A; UNSATURATED CHAIN-A  
LT 115-07-1-P; C3-P; HYDROCARBON-P; MONOOLEFINIC-P; PROPENE-P; SINGLE  
STRUCTURE TYPE-P; TERMINAL OLEFINIC-P; UNSATURATED CHAIN-P  
LT 75-56-9-P; C3-P; EPOXY-P; PROPYLENE OXIDE-P; SATURATED CHAIN-P  
LT COMPOUNDS-A; HYDROCARBON-A; UNSATURATED-A; UNSATURATED CARBOCYCLIC-A  
LT 110-83-8-A; 6 MEMBER RING-A; C6-A; CYCLOHEXENE-A; HYDROCARBON-A;  
MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; UNSATURATED CARBOCYCLIC-A  
LT 286-20-4-P; 6 MEMBER RING-P; C6-P; CYCLOHEXENE OXIDE-P; EPOXY-P; FUSED OR  
BRIDGED RING-P; SATURATED CARBOCYCLIC-P; SINGLE STRUCTURE TYPE-P  
LT COMPOUNDS-P; EPOXY-P; FUSED OR BRIDGED RING-P; SATURATED CARBOCYCLIC-P  
LT 107-18-6-A; ALLYL ALCOHOL-A; C3-A; MONOHYDROXY-A; MONOOLEFINIC-A; SINGLE  
STRUCTURE TYPE-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A  
LT C3-P; EPOXY-P; MONOHYDROXY-P; SATURATED CHAIN-P  
LT CARBOXYLIC ANHYDRIDE-A; COMPOUNDS-A; MONOCARBOXYLIC ACID-A;  
MULTICARBOXYLIC ACID-A  
LT COMPOUNDS-A; INTERNAL OLEFINIC-A; MONOCARBOXYLIC ESTER-A; MONOOLEFINIC-A;  
MULTICARBOXYLIC ESTER-A; STRAIGHT CHAIN-A; UNSATURATED CHAIN-A  
LT 110-16-7-A; C4-A; CIS ISOMER; GEOMETRIC ISOMER; INTERNAL OLEFINIC-A;  
ISOMER; MALEIC ACID-A; MOLECULAR STRUCTURE; MONOOLEFINIC-A;  
MULTICARBOXYLIC ACID-A; SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A;

UNSATURATED CHAIN-A  
LT 110-17-8-A; C4-A; CIS ISOMER; FUMARIC ACID-A; GEOMETRIC ISOMER; INTERNAL OLEFINIC-A; ISOMER; MOLECULAR STRUCTURE; MONOOLEFINIC-A; MULTICARBOXYLIC ACID-A; SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A; UNSATURATED CHAIN-A  
LT COMPOUNDS-P; EPOXY-P; MONOCARBOXYLIC ESTER-P; MULTICARBOXYLIC ESTER-P  
LT C4-P; CIS ISOMER; EPOXY-P; GEOMETRIC ISOMER; ISOMER; MOLECULAR STRUCTURE; MULTICARBOXYLIC ACID-P; TRANS ISOMER  
LT 67-56-1; C1; METHANOL; MONOHYDROXY; NONHYDROCARBON SOLVENT; ORGANIC SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE TYPE; SOLVENT; USE  
LT ELEMENT; GROUP VA; NITROGEN  
ATM Template not available

L110 ANSWER 10 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING INFORMATION INC. on STN  
AN 94:12408 ENCOMPAT;ENCOMPAT2  
DN 9454977  
TI Optically active **epoxide**(s) prepn. - by reacting **olefin** (s) in oxygen in presence of optically active metal cpd  
PA MITSUI PETROCHEM IND CO LTD  
PI JP 6247993 940906  
AI JP 1993-50918 930311  
PRAI JP 1992-349635 921228  
FI JP 6247993 940906  
OS DERWENT 94322190  
IC B01J035-02; C07B053-00; C07C225-16; C07D301-06; C07D303-04; C07D303-08; C07D303-40; C07F013-00  
CC CATALYSTS/ZEOLITES; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS; OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM  
CT 108-88-3; 108-90-7; 110-62-3-A; 123-38-6-A; 123-72-8-A; 1330-20-7; 447-53-0-A; 462-06-6; 71-43-2; 75-07-0-A; 7631-86-9; 1,2-DIHYDRONAPHTHALENE-A; 6 MEMBER RING-A; ACETALDEHYDE-A; ADSORBENT; AGITATING; AGROCHEMICAL; ALDEHYDE-NA; ANALYTICAL METHOD; ANION; BENZENE; BENZENE RING-NAP; BRANCHED CHAIN-A; BUTYRALDEHYDE-A; C10-A; C11-A; C12-A; C13-16-A; C2-A; C3-A; C4-A; C5-A; C6; C7; C8; **CATALYST**; CHLOROBENZENE; CHLOROHYDROCARBON; CHROMATOGRAPHY; COLLOID/DISPERSION; COLUMN; COMPLEX; \*COMPOUNDS-N\*AP; COST; COST REDUCTION; ECONOMIC FACTOR; ELEMENT-A; \*EPOXIDATION; EPOXY-P; FLUOROBENZENE; **FLUOROHYDROCARBON**; FUSED OR BRIDGED RING-AP; GEL; GEOMETRIC ISOMER; GROUP IVA; GROUP VIA-NA; GROUP VIIB; HALOHYDROCARBON; \*HYDROCARBON-N\*A; HYDROCARBON SOLVENT; IDE; INTERNAL OLEFINIC-NA; ION; ISOMER; KETONE; LIQUID CRYSTAL; MANGANESE; MOLECULAR STRUCTURE; MONOCARBOXYLIC ESTER; MONOOLEFINIC-NA; MULTIAMINE; MULTICARBOXYLIC ESTER; MULTIOLEFINIC-NA; NONHYDROCARBON SOLVENT; \*OLEFIN-\*A; OPERATING CONDITION; OPTICAL ACTIVITY; OPTICAL PROPERTY; ORGANIC SOLVENT; \*OXIDATION REACTION; OXYGEN-NA; PENTANAL-A; PHARMACEUTICAL PRODUCT; PHYSICAL PROPERTY; PHYSICAL SEPARATION; PROPIONALDEHYDE-A; PURIFYING; REACTION TIME; SATURATED CHAIN-NA; SILICA; SILICON; SINGLE STRUCTURE TYPE-NA; SOLUTION; SOLVENT; SORBENT; STEREOISOMER; STRAIGHT CHAIN-A; TEMPERATURE; TEMPERATURE -10 TO 20 C; TEMPERATURE 20 TO 40 C; TEMPERATURE 40 TO 80 C; TERMINAL OLEFINIC-NA; TOLUENE; \*UNSATURATED-\*A; UNSATURATED CARBOCYCLIC-A; UNSATURATED CHAIN-NA; USE; XYLENE  
LT BENZENE RING-P; COMPOUNDS-P; EPOXY-P; FUSED OR BRIDGED RING-P; GEOMETRIC ISOMER; ISOMER; MOLECULAR STRUCTURE; STEREOISOMER  
LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A  
LT ELEMENT-A; GROUP VIA-A; OXYGEN-A  
LT ALDEHYDE-A; COMPOUNDS-A  
LT BRANCHED CHAIN-A; C11-A; HYDROCARBON-A; INTERNAL OLEFINIC-A; MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; UNSATURATED CHAIN-A  
LT BENZENE RING-A; C13-16-A; HYDROCARBON-A; MONOOLEFINIC-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A

LT BENZENE RING-A; C12-A; FUSED OR BRIDGED RING-A; HYDROCARBON-A;  
MONOOLEFINIC-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A  
LT 75-07-0-A; ACETALDEHYDE-A; ALDEHYDE-A; C2-A; SATURATED CHAIN-A; SINGLE  
STRUCTURE TYPE-A  
LT 123-38-6-A; ALDEHYDE-A; C3-A; PROPIONALDEHYDE-A; SATURATED CHAIN-A; SINGLE  
STRUCTURE TYPE-A  
LT 123-72-8-A; ALDEHYDE-A; BUTYRALDEHYDE-A; C4-A; SATURATED CHAIN-A; SINGLE  
STRUCTURE TYPE-A; STRAIGHT CHAIN-A  
LT 110-62-3-A; ALDEHYDE-A; C5-A; PENTANAL-A; SATURATED CHAIN-A; SINGLE  
STRUCTURE TYPE-A; STRAIGHT CHAIN-A  
LT ALDEHYDE-A; BRANCHED CHAIN-A; C5-A; SATURATED CHAIN-A; SINGLE STRUCTURE  
TYPE-A  
LT ALDEHYDE; BENZENE RING; CATALYST; COMPLEX; COMPOUNDS; GEOMETRIC ISOMER;  
GROUP VII B; INTERNAL OLEFINIC; ISOMER; KETONE; MANGANESE; MOLECULAR  
STRUCTURE; MONOCARBOXYLIC ESTER; MONOOLEFINIC; MULTIAMINE; MULTICARBOXYLIC  
ESTER; MULTIOLEFINIC; STEREOISOMER; TERMINAL OLEFINIC; UNSATURATED CHAIN;  
USE  
LT 71-43-2; BENZENE; BENZENE RING; C6; HYDROCARBON; HYDROCARBON SOLVENT;  
ORGANIC SOLVENT; SINGLE STRUCTURE TYPE; SOLVENT; USE  
LT 108-88-3; BENZENE RING; C7; HYDROCARBON; HYDROCARBON SOLVENT; ORGANIC  
SOLVENT; SATURATED CHAIN; SOLVENT; TOLUENE; USE  
LT 1330-20-7; BENZENE RING; C8; HYDROCARBON; HYDROCARBON SOLVENT; ORGANIC  
SOLVENT; SATURATED CHAIN; SOLVENT; USE; XYLENE  
LT 108-90-7; BENZENE RING; C6; CHLOROBENZENE; CHLOROHYDROCARBON;  
HALOHYDROCARBON; NONHYDROCARBON SOLVENT; ORGANIC SOLVENT; SINGLE STRUCTURE  
TYPE; SOLVENT; USE  
LT 462-06-6; BENZENE RING; C6; FLUOROBENZENE; FLUOROHYDROCARBON;  
HALOHYDROCARBON; NONHYDROCARBON SOLVENT; ORGANIC SOLVENT; SINGLE STRUCTURE  
TYPE; SOLVENT; USE  
LT 447-53-0-A; 1,2-DIHYDRONAPHTHALENE-A; 6 MEMBER RING-A; BENZENE RING-A;  
C10-A; FUSED OR BRIDGED RING-A; HYDROCARBON-A; MONOOLEFINIC-A;  
MULTIOLEFINIC-A; SINGLE STRUCTURE TYPE-A; UNSATURATED CARBOCYCLIC-A  
LT 7631-86-9; ADSORBENT; GROUP IVA; GROUP VIA; IDE; OXYGEN; SILICA; SILICON;  
SORBENT; USE  
ATM Template not available

L110 ANSWER 11 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 93:4251 ENCOMPAT;ENCOMPAT2

DN 9352135

TI Alicyclic **epoxide** prepn. avoiding use of peroxide - comprises  
reacting aliphatic **olefin** with oxygen in presence of aliphatic  
satd. aldehyde and metal **catalyst**

PA MITSUI PETROCHEM IND CO LTD

PI JP 5032647 930209

AI JP 1991-208906 910726

PRAI JP 1991-208906 910726

FI JP 5032647 930209

OS DERWENT 93088642

IC B01J027-232; B01J031-12; C07B061-00; C07D301-06; C07D303-40

CC CATALYSTS & CATALYSIS; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM

CT 123-54-6; 123-72-8-A; 3264-82-2; 513-77-9; 546-93-0; 75-09-2;  
(2,4-PENTANEDIONATO)NICKEL; 2,4-PENTANEDIONE; 6 MEMBER RING-AP; AGITATING;  
AIR-A; ALDEHYDE-A; ATE; BARIUM; BARIUM CARBONATE, BAC03; BUTYRALDEHYDE-A;  
C1; C13-16-AP; C2-A; C3-A; C4-A; C5-NA; C6-A; CARBON; \***CATALYST**;  
CHLOROHYDROCARBON; COMPLEX; COMPOSITION; COMPOUNDS-NAP; CONCENTRATION;  
DICHLOROMETHANE; ELEMENT-A; \*EPOXIDATION; \*EPOXY-\*P; FUSED OR BRIDGED  
RING-P; GROUP IIA; GROUP IVA; GROUP VIA-NA; GROUP VIII; HALOHYDROCARBON;  
HAZARD; HYDROCARBON SOLVENT; KETONE; MAGNESIUM; MAGNESIUM CARBONATE;

MONOCARBOXYLIC ESTER-NAP; MULTICARBOXYLIC ESTER; MULTIOLEFINIC-A; NICKEL;  
NITRILE; NONE; NONHYDROCARBON SOLVENT; OPERATING CONDITION; ORGANIC  
SOLVENT; \*OXIDATION REACTION; OXYGEN-NA; OXYGEN CONTENT; PARTIAL PRESSURE;  
PEROXY; PRESSURE; REACTION TIME; SAFETY; SATURATED CARBOCYCLIC-P;  
SATURATED CHAIN-NAP; SINGLE STRUCTURE TYPE-NA; SOLVENT; STRAIGHT CHAIN-NA;  
TEMPERATURE; TEMPERATURE -10 TO 20 C; TEMPERATURE 20 TO 40 C; TEMPERATURE  
40 TO 80 C; TEMPERATURE 80 TO 125 C; UNSATURATED CARBOCYCLIC-A; \*USE;  
YIELD

LT COMPOUNDS; NONE; PEROXY

LT 6 MEMBER RING-A; COMPOUNDS-A; MONOCARBOXYLIC ESTER-A; MULTIOLEFINIC-A;  
SATURATED CHAIN-A; UNSATURATED CARBOCYCLIC-A

LT ELEMENT-A; GROUP VIA-A; OXYGEN-A

LT 6 MEMBER RING-P; COMPOUNDS-P; EPOXY-P; FUSED OR BRIDGED RING-P;  
MONOCARBOXYLIC ESTER-P; SATURATED CARBOCYCLIC-P; SATURATED CHAIN-P

LT ALDEHYDE-A; C2-A; C3-A; C4-A; C5-A; C6-A; COMPOUNDS-A; SATURATED CHAIN-A;  
SINGLE STRUCTURE TYPE-A

LT HAZARD; NONE

LT COMPOUNDS; HALOHYDROCARBON; NONHYDROCARBON SOLVENT; ORGANIC SOLVENT;  
SOLVENT; USE

LT COMPOUNDS; MONOCARBOXYLIC ESTER; MULTICARBOXYLIC ESTER; NONHYDROCARBON  
SOLVENT; ORGANIC SOLVENT; SOLVENT; USE

LT COMPOUNDS; NITRILE; NONHYDROCARBON SOLVENT; ORGANIC SOLVENT; SOLVENT; USE

LT 6 MEMBER RING-A; C13-16-A; MONOCARBOXYLIC ESTER-A; MULTIOLEFINIC-A;  
SATURATED CHAIN-A; UNSATURATED CARBOCYCLIC-A

LT 6 MEMBER RING-P; C13-16-P; EPOXY-P; FUSED OR BRIDGED RING-P;  
MONOCARBOXYLIC ESTER-P; SATURATED CARBOCYCLIC-P; SATURATED CHAIN-P

LT 123-72-8-A; ALDEHYDE-A; BUTYRALDEHYDE-A; C4-A; SATURATED CHAIN-A; SINGLE  
STRUCTURE TYPE-A; STRAIGHT CHAIN-A

LT 75-09-2; C1; CHLOROHYDROCARBON; DICHLOROMETHANE; HALOHYDROCARBON;  
NONHYDROCARBON SOLVENT; ORGANIC SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE  
TYPE; SOLVENT; USE

LT 123-54-6; 3264-82-2; (2,4-PENTANEDIONATO)NICKEL; 2,4-PENTANEDIONE; C5;  
CATALYST; COMPLEX; GROUP VIII; KETONE; NICKEL; SATURATED CHAIN; SINGLE  
STRUCTURE TYPE; STRAIGHT CHAIN; USE

LT 123-54-6; 3264-82-2; 513-77-9; (2,4-PENTANEDIONATO)NICKEL;  
2,4-PENTANEDIONE; ATE; BARIUM; BARIUM CARBONATE, BACO3; C5; CARBON;  
CATALYST; COMPLEX; GROUP IIA; GROUP IVA; GROUP VIA; GROUP VIII; KETONE;  
NICKEL; OXYGEN; SATURATED CHAIN; SINGLE STRUCTURE TYPE; STRAIGHT CHAIN;  
USE

LT 123-54-6; 3264-82-2; 546-93-0; (2,4-PENTANEDIONATO)NICKEL;  
2,4-PENTANEDIONE; ATE; C5; CARBON; CATALYST; COMPLEX; GROUP IIA; GROUP  
IVA; GROUP VIA; GROUP VIII; KETONE; MAGNESIUM; MAGNESIUM CARBONATE;  
NICKEL; OXYGEN; SATURATED CHAIN; SINGLE STRUCTURE TYPE; STRAIGHT CHAIN;  
USE

LT ATE; CARBON; CATALYST; GROUP IVA; GROUP VIA; GROUP VIII; NICKEL; OXYGEN;  
USE

LT 513-77-9; ATE; BARIUM; BARIUM CARBONATE, BACO3; CARBON; CATALYST; GROUP  
IIA; GROUP IVA; GROUP VIA; GROUP VIII; NICKEL; OXYGEN; USE

LT 546-93-0; ATE; CARBON; CATALYST; GROUP IIA; GROUP IVA; GROUP VIA; GROUP  
VIII; MAGNESIUM; MAGNESIUM CARBONATE; NICKEL; OXYGEN; USE

ATM Template not available

L110 ANSWER 12 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 93:2236 ENCOMPAT;ENCOMPAT2

DN 9350852

TI Prodn. of **epoxidated** alicyclic **olefin(s)** useful as  
intermediates - by **epoxidation** of cycloolefin cpds. with aq.  
hydrogen peroxide soln. contg. hetero-poly acid and water insol. solvent  
contg. onium salt

PA TOSOH CORP  
PI JP 4316566 921106  
AI JP 1991-108355 910415  
PRAI JP 1991-108355 910415  
FI JP 4316566 921106  
OS DERWENT 92420422  
IC B01J027-188; B01J031-02; C07B061-00; C07D301-12; C07D303-04; C07D303-06;  
C07D303-08; C07D303-10  
CC CATALYSTS & CATALYSIS; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM  
CT 11104-88-4; 12067-99-1; 123-31-9; 141-78-6; 67-66-3; 71-43-2; 7722-84-1-A;  
5 MEMBER RING-P; 6 MEMBER RING; **ACTIVATOR**; ADDITIVE; ATE;  
BENZENE; BENZENE RING; BRANCHED CHAIN-AP; C1; C11-AP; C13-16; C17-25; C26  
AND UP; C4; C5-12; C6; **\*CATALYST**; CHLORINE; CHLOROFORM;  
CHLOROHYDROCARBON; COMPOSITION; COMPOUNDS-NAP; CONCENTRATION; COOLING;  
\*EPOXIDATION; \*EPOXY-\*P; ETHYL ACETATE; FUSED OR BRIDGED RING-AP; GROUP  
VA; GROUP VIA-NA; GROUP VIB; GROUP VIIA; HALOHYDROCARBON; HEATING;  
HETEROCYCLIC; HETEROPOLYACID; HYDROCARBON; HYDROCARBON SOLVENT;  
HYDROGEN-NA; HYDROGEN PEROXIDE-A; HYDROQUINONE; IDE-NA; INORGANIC SOLVENT;  
INSOLUBLE; MOLYBDENUM; MOLYBDOPHOSPHORIC ACID; MONOAMINE; \*MONOCARBOXYLIC  
ESTER-NA\*P; MONOHYDROXY-AP; MONOOLEFINIC-AP; MULTIHYDROXY;  
MULTIOLEFINIC-NA; NONHYDROCARBON SOLVENT; ORGANIC SALT; ORGANIC SOLVENT;  
\*OXIDATION REACTION; OXYGEN-NA; PHOSPHORUS; PHOSPHORUS ORGANIC; PHYSICAL  
PROPERTY; POLYMERIZATION INHIBITOR; SATURATED CARBOCYCLIC-AP; SATURATED  
CHAIN-NAP; SINGLE STRUCTURE TYPE; SOLUBILITY; SOLVENT; STRAIGHT CHAIN;  
TERMINAL OLEFINIC-AP; TUNGSTEN; TUNGSTOPHOSPHORIC ACID; UNSATURATED  
CARBOCYCLIC-A; UNSATURATED CHAIN-AP; \*USE; WATER; WATER INSOLUBLE; WATER  
SOLUBILITY  
LT 7722-84-1-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-A; OXYGEN-A  
LT INORGANIC SOLVENT; SOLVENT; USE; WATER  
LT BRANCHED CHAIN-P; COMPOUNDS-P; EPOXY-P; FUSED OR BRIDGED RING-P;  
MONOCARBOXYLIC ESTER-P; MONOHYDROXY-P; MONOOLEFINIC-P; SATURATED  
CARBOCYCLIC-P; SATURATED CHAIN-P; TERMINAL OLEFINIC-P; UNSATURATED CHAIN-P  
LT 5 MEMBER RING-P; BRANCHED CHAIN-P; COMPOUNDS-P; EPOXY-P; FUSED OR BRIDGED  
RING-P; MONOCARBOXYLIC ESTER-P; MONOHYDROXY-P; MONOOLEFINIC-P; SATURATED  
CARBOCYCLIC-P; TERMINAL OLEFINIC-P; UNSATURATED CHAIN-P  
LT COMPOUNDS-A; MONOCARBOXYLIC ESTER-A; MONOHYDROXY-A; MONOOLEFINIC-A;  
MULTIOLEFINIC-A; SATURATED CHAIN-A; TERMINAL OLEFINIC-A; UNSATURATED  
CARBOCYCLIC-A; UNSATURATED CHAIN-A  
LT 71-43-2; BENZENE; BENZENE RING; C6; HYDROCARBON; HYDROCARBON SOLVENT;  
ORGANIC SOLVENT; SINGLE STRUCTURE TYPE; SOLVENT; USE  
LT 141-78-6; C4; ETHYL ACETATE; MONOCARBOXYLIC ESTER; NONHYDROCARBON SOLVENT;  
ORGANIC SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE TYPE; SOLVENT; USE  
LT 123-31-9; ADDITIVE; BENZENE RING; C6; HYDROQUINONE; MULTIHYDROXY;  
POLYMERIZATION INHIBITOR; SINGLE STRUCTURE TYPE; USE  
LT 6 MEMBER RING; ACTIVATOR; C17-25; CHLORINE; GROUP VIIA; HETEROCYCLIC; IDE;  
MONOAMINE; MULTIOLEFINIC; ORGANIC SALT; SATURATED CHAIN; STRAIGHT CHAIN;  
USE  
LT BRANCHED CHAIN-A; C11-A; FUSED OR BRIDGED RING-A; MONOCARBOXYLIC ESTER-A;  
MULTIOLEFINIC-A; SATURATED CARBOCYCLIC-A; TERMINAL OLEFINIC-A; UNSATURATED  
CARBOCYCLIC-A; UNSATURATED CHAIN-A  
LT 67-66-3; C1; CHLOROFORM; CHLOROHYDROCARBON; HALOHYDROCARBON;  
NONHYDROCARBON SOLVENT; ORGANIC SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE  
TYPE; SOLVENT; USE  
LT BRANCHED CHAIN-P; C11-P; EPOXY-P; FUSED OR BRIDGED RING-P; MONOCARBOXYLIC  
ESTER-P; MONOOLEFINIC-P; SATURATED CARBOCYCLIC-P; TERMINAL OLEFINIC-P;  
UNSATURATED CHAIN-P  
LT 11104-88-4; ATE; CATALYST; GROUP VA; GROUP VIA; GROUP VIB; HETEROPOLYACID;  
HYDROGEN; MOLYBDENUM; MOLYBDOPHOSPHORIC ACID; OXYGEN; PHOSPHORUS; USE  
LT 12067-99-1; ATE; CATALYST; GROUP VA; GROUP VIA; GROUP VIB; HETEROPOLYACID;

HYDROGEN; OXYGEN; PHOSPHORUS; TUNGSTEN; TUNGSTOPHOSPHORIC ACID; USE  
LT ACTIVATOR; C13-16; C17-25; C26 AND UP; C4; C5-12; COMPOUNDS; GROUP VIIA;  
IDE; MONOAMINE; ORGANIC SALT; SATURATED CHAIN; SINGLE STRUCTURE TYPE; USE  
LT ACTIVATOR; C13-16; C17-25; C26 AND UP; C4; C5-12; COMPOUNDS; GROUP VIIA;  
IDE; ORGANIC SALT; PHOSPHORUS ORGANIC; SATURATED CHAIN; SINGLE STRUCTURE  
TYPE; USE  
ATM Template not available

L110 ANSWER 13 OF 18 ENCOMPPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN  
AN 92:2131 ENCOMPPAT;ENCOMPPAT2  
DN 9250771  
TI Prepn. of **epoxy** cpd. from **olefin** - using oxygen-contg.  
gas, in presence of alcohol and beta-diketone nickel complex  
PA Mitsui Petrochem Ind KK  
PI JP 3246288 911101  
PRAI JP 1990-10261 900119  
FI JP 3246288 911101  
OS DERWENT 91365832  
IC B01J029-04; B01J031-22; C07B061-00; C07D301-06  
CC CATALYSTS & CATALYSIS; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM  
CT \*111-67-1-\*A; 71-23-8; \*872-05-9-\*A; \*1-DECENE-\*A; \*2-OCTENE-\*A; 6 MEMBER  
RING; AIR-A; ALUMINUM; ALUMINUM SILICATES; ATE; ATMOSPHERIC PRESSURE;  
BENZENE RING-NAP; BRANCHED CHAIN-NA; \*C10-\*AP; C11-NAP; C3; C4; C6;  
\*C8-N\*AP; \*CATALYST; CHLORINE; CIS ISOMER; COMPLEX; COMPOSITION;  
COMPOUNDS-NAP; CONCENTRATION; EFFICIENCY; ELEMENT-A; \*EPOXIDATION;  
EPOXY-P; FUSED OR BRIDGED RING-NAP; GAS; GEOMETRIC ISOMER; GROUP IIIA;  
GROUP IVA; GROUP VIA-NA; GROUP VIIA; GROUP VIII; HALOGEN ORGANIC; HEATING;  
\*HYDROCARBON-\*A; IDE; \*INTERNAL OLEFINIC-\*A; ISOMER; ITE; KETONE;  
MOLECULAR STRUCTURE; MONOHYDROXY; \*MONOOLEFINIC-\*A; NICKEL; NONE;  
OPERATING CONDITION; \*OXIDATION REACTION; OXYGEN-NA; PARTIAL PRESSURE;  
\*PHYSICAL PROPERTY; POLYMER; PRESSURE; PRESSURE 10 TO 150 PSIG; PRESSURE  
150 TO 300 PSIG; PROPYL ALCOHOL; REACTION TIME; RECOVERY; SATURATED  
CARBOCYCLIC-NP; SATURATED CHAIN-NP; \*SELECTIVITY; SILICON; \*SINGLE  
STRUCTURE TYPE-N\*AP; \*STRAIGHT CHAIN-N\*AP; STRUCTURAL ISOMER; SYNTHETIC  
ZEOLITE; TEMPERATURE; TEMPERATURE 125 TO 200 C; TEMPERATURE 40 TO 80 C;  
TEMPERATURE 80 TO 125 C; \*TERMINAL OLEFINIC-\*A; TRANS ISOMER; UNSATURATED  
CARBOCYCLIC-A; \*UNSATURATED CHAIN-\*A; \*USE; VACUUM; YIELD; ZEOLITE  
LT BENZENE RING-A; COMPOUNDS-A; FUSED OR BRIDGED RING-A; HYDROCARBON-A;  
INTERNAL OLEFINIC-A; MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; TERMINAL  
OLEFINIC-A; UNSATURATED CARBOCYCLIC-A; UNSATURATED CHAIN-A  
LT ELEMENT-A; GROUP VIA-A; OXYGEN-A  
LT BENZENE RING-P; COMPOUNDS-P; EPOXY-P; FUSED OR BRIDGED RING-P; SATURATED  
CARBOCYCLIC-P; SATURATED CHAIN-P; SINGLE STRUCTURE TYPE-P  
LT C3; ISOMER; MOLECULAR STRUCTURE; MONOHYDROXY; SATURATED CHAIN; SINGLE  
STRUCTURE TYPE; STRUCTURAL ISOMER  
LT BENZENE RING; BRANCHED CHAIN; CATALYST; COMPLEX; COMPOUNDS; FUSED OR  
BRIDGED RING; GROUP VIII; HALOGEN ORGANIC; KETONE; NICKEL; SATURATED  
CARBOCYCLIC; SATURATED CHAIN; SINGLE STRUCTURE TYPE; STRAIGHT CHAIN; USE  
LT ALUMINUM; ALUMINUM SILICATES; ATE; BENZENE RING; BRANCHED CHAIN; CATALYST;  
COMPLEX; COMPOUNDS; FUSED OR BRIDGED RING; GROUP IIIA; GROUP IVA; GROUP  
VIA; GROUP VIII; HALOGEN ORGANIC; IDE; KETONE; NICKEL; OXYGEN; SATURATED  
CARBOCYCLIC; SATURATED CHAIN; SILICON; SINGLE STRUCTURE TYPE; STRAIGHT  
CHAIN; SYNTHETIC ZEOLITE; USE; ZEOLITE  
LT CHLORINE; COMPOUNDS; GROUP VIA; GROUP VIIA; ITE; NONE; OXYGEN  
LT C4; COMPOUNDS; ISOMER; MOLECULAR STRUCTURE; MONOHYDROXY; SATURATED CHAIN;  
SINGLE STRUCTURE TYPE; STRUCTURAL ISOMER  
LT BRANCHED CHAIN; C6; CATALYST; COMPLEX; GROUP VIII; KETONE; NICKEL;  
SATURATED CHAIN; SINGLE STRUCTURE TYPE; USE



LT BENZENE RING; BRANCHED CHAIN; C11; CATALYST; COMPLEX; GROUP VIII; KETONE;  
NICKEL; SATURATED CHAIN; USE  
LT 6 MEMBER RING; C8; CATALYST; COMPLEX; GROUP VIII; KETONE; NICKEL;  
SATURATED CARBOCYCLIC; SATURATED CHAIN; USE  
LT BRANCHED CHAIN-A; C10-A; C11-A; HYDROCARBON-A; INTERNAL OLEFINIC-A;  
MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; UNSATURATED CHAIN-A  
LT 111-67-1-A; 2-OCTENE-A; C8-A; CIS ISOMER; GEOMETRIC ISOMER; HYDROCARBON-A;  
INTERNAL OLEFINIC-A; ISOMER; MOLECULAR STRUCTURE; MONOOLEFINIC-A; SINGLE  
STRUCTURE TYPE-A; STRAIGHT CHAIN-A; UNSATURATED CHAIN-A  
LT 872-05-9-A; 1-DECENE-A; C10-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE  
STRUCTURE TYPE-A; STRAIGHT CHAIN-A; TERMINAL OLEFINIC-A; UNSATURATED  
CHAIN-A  
LT C10-P; C11-P; EPOXY-P; SATURATED CHAIN-P; STRAIGHT CHAIN-P  
LT C8-P; CIS ISOMER; EPOXY-P; GEOMETRIC ISOMER; ISOMER; MOLECULAR STRUCTURE;  
SATURATED CHAIN-P; STRAIGHT CHAIN-P; TRANS ISOMER  
LT 71-23-8; C3; MONOHYDROXY; PROPYL ALCOHOL; SATURATED CHAIN; SINGLE  
STRUCTURE TYPE  
ATM Template not available

L110 ANSWER 14 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 90:9261 ENCOMPAT;ENCOMPAT2

DN 9053516

TI **Epoxy** cpds. prepn. - by reaction of **olefin** with  
hydroperoxide in presence of molybdenum, ruthenium and/or osmium  
**catalyst**

PA Sumitomo Chem Ind KK

PI JP 2157270 900618

PRAI JP 1988-314178 881212

FI JP 2157270 900618

OS DERWENT 90228699

IC C07D301-19

CC CATALYSTS & CATALYSIS; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
OXYGEN COMPOUNDS; PETROLEUM REFINING AND PETROCHEM

CT ADDITIVE; ANTIFREEZE; BROMINE; CARBON; \***CATALYST**; CHLORINE;  
COMPLEX; COMPOSITION; \*COMPOUNDS-N\*AP; CONCENTRATION; COSMETIC;  
\*EPOXIDATION; \*EPOXY-\*P; GROUP IVA; GROUP VIA; GROUP VIB; GROUP VIIA;  
GROUP VIII; HALOHYDROCARBON; \*HYDROCARBON-\*A; IDE; IODINE; MOLYBDENUM;  
MONOHYDROXY; \*OLEFIN-\*A; ORGANIC SALT; OSMIUM; \*OXIDATION REACTION;  
OXYGEN; PERFUME; PEROXY-A; PLATINUM METALS; POLYESTER; POLYURETHANE;  
RUTHENIUM; STABILIZER; SURFACE ACTIVE AGENT; \*UNSATURATED-\*A; \*USE

LT COMPOUNDS-P; EPOXY-P

LT COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A; UNSATURATED-A

LT COMPOUNDS-A; PEROXY-A

LT ADDITIVE; SURFACE ACTIVE AGENT; USE

LT COMPOUNDS; POLYESTER

LT COMPOUNDS; POLYURETHANE

LT COMPOUNDS; HALOHYDROCARBON

LT COMPOUNDS; MONOHYDROXY

LT CATALYST; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIII; MOLYBDENUM; ORGANIC  
SALT; OSMIUM; PLATINUM METALS; RUTHENIUM; USE

LT CATALYST; CHLORINE; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIIA; GROUP VIII;  
IDE; MOLYBDENUM; OSMIUM; PLATINUM METALS; RUTHENIUM; USE

LT BROMINE; CATALYST; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIIA; GROUP VIII;  
IDE; MOLYBDENUM; OSMIUM; PLATINUM METALS; RUTHENIUM; USE

LT CATALYST; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIIA; GROUP VIII; IDE;  
IODINE; MOLYBDENUM; OSMIUM; PLATINUM METALS; RUTHENIUM; USE

LT CARBON; CATALYST; COMPLEX; COMPOUNDS; GROUP IVA; GROUP VIA; GROUP VIB;  
GROUP VIII; IDE; MOLYBDENUM; OSMIUM; OXYGEN; PLATINUM METALS; RUTHENIUM;  
USE

LT CATALYST; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIII; MOLYBDENUM; ORGANIC  
SALT; OSMIUM; PLATINUM METALS; USE  
LT CATALYST; CHLORINE; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIIA; GROUP VIII;  
IDE; MOLYBDENUM; OSMIUM; PLATINUM METALS; USE  
LT BROMINE; CATALYST; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIIA; GROUP VIII;  
IDE; MOLYBDENUM; OSMIUM; PLATINUM METALS; USE  
LT CATALYST; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIIA; GROUP VIII; IDE;  
IODINE; MOLYBDENUM; OSMIUM; PLATINUM METALS; USE  
LT CARBON; CATALYST; COMPLEX; COMPOUNDS; GROUP IVA; GROUP VIA; GROUP VIB;  
GROUP VIII; IDE; MOLYBDENUM; OSMIUM; OXYGEN; PLATINUM METALS; USE  
LT CATALYST; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIII; MOLYBDENUM; ORGANIC  
SALT; PLATINUM METALS; RUTHENIUM; USE  
LT CATALYST; CHLORINE; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIIA; GROUP VIII;  
IDE; MOLYBDENUM; PLATINUM METALS; RUTHENIUM; USE  
LT BROMINE; CATALYST; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIIA; GROUP VIII;  
IDE; MOLYBDENUM; PLATINUM METALS; RUTHENIUM; USE  
LT CATALYST; COMPLEX; COMPOUNDS; GROUP VIB; GROUP VIIA; GROUP VIII; IDE;  
IODINE; MOLYBDENUM; PLATINUM METALS; RUTHENIUM; USE  
LT CARBON; CATALYST; COMPLEX; COMPOUNDS; GROUP IVA; GROUP VIA; GROUP VIB;  
GROUP VIII; IDE; MOLYBDENUM; OXYGEN; PLATINUM METALS; RUTHENIUM; USE

L110 ANSWER 15 OF 18 ENCOMPPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN

AN 90:3680 ENCOMPPAT;ENCOMPPAT2

DN 9020849

TI **Epoxidised** poly-alpha-olefin oligomer lubricants -  
having same viscometric properties as non **epoxidised** starting  
materials

PA Mobil Oil Corp

PI WO 8912651 891228

DS AT; BE; CH; DE; FR; GB; IT; LU; NL; SE; AU; JP

PRAI US 1988-210453 880623

FI WO 8912651 891228

OS DERWENT 90022521

IC C08F008-08; C10M101-02; C10M107-02; C10M107-18; C10M111-04; C10M143-18;  
C10M153-04; C10M155-04; C10N020-00; C10N030-06; C10N040-00; C10N050-10

CC CATALYSTS & CATALYSIS; CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS;  
LUBRICANTS AND INDUSTRIAL OILS; PETROLEUM PRODUCTS; PETROLEUM REFINING AND  
PETROCHEM; POLYMERIZATION CATALYSTS; POLYMERS; PURE HYDROCARBONS

CT 111-66-0-A; 11118-57-3; 112-41-4-A; 12795-06-1; 630-08-0; 75-15-0;  
75-18-3; 7631-86-9; 7664-41-7; 7722-84-1-A; 7783-06-4; 872-05-9-A;  
1-DECENE-A; 1-DODECENE-A; 1-OCTENE-A; ACIDIC; ACIDITY/BASICITY; \*ADDITION  
POLYMERIZATION; ADDITIVE; ALKENE-A; AMMONIA; BASIC; BENZENE RING-A; BORON  
ORGANIC-P; BRANCHED CHAIN-P; BRANCHING; C10-A; C10 MONOMER-P; C11-P;  
C12-AP; C12 MONOMER-P; C13-16-AP; C13-16 MONOMER-AP; C17-25-AP; C17-25  
MONOMER-AP; C2; C26 AND UP-AP; C5-12-A; C5-12 MONOMER-AP; C8-A; C8  
MONOMER-P; CARBON; CARBON DISULFIDE; CARBON MONOXIDE; CARBON OXIDE;  
CARBOXAMIDE; \*CATALYST; CATALYST SUPPORT;  
CHLOROHYDROCARBON; CHROMIUM; CHROMIUM OXIDE; COMPOSITION; COMPOUNDS-NAP;  
COPOLYMER; CORROSION RESISTANCE; DECOMPOSITION; DETERGENT ADDITIVE;  
DISPERSANT; DISULFIDE; ELEMENT; \*EPOXIDATION; EPOXY-P; ESTER LUBRICANT-P;  
ETHER; **FLUOROHYDROCARBON**; FRICTION; GAS; GREASE; GROUP IVA;  
GROUP VA; GROUP VIA-NA; GROUP VIB; HALOHYDROCARBON; HIGH MOLECULAR WEIGHT;  
HIGH VISCOSITY INDEX; HOMOPOLYMER-NAP; HYDROCARBON-AP; HYDROGEN-NA;  
HYDROGEN PEROXIDE-A; HYDROGEN SULFIDE; HYDROGENATION; IDE-NA; INORGANIC  
SOLVENT; LIQUID; LUBRICANT STOCK; \*LUBRICANT/INDUSTRIAL OIL-NA\*P; METHYL  
SULFIDE; MICROSTRUCTURE; MIXTURE; MOBIL OIL; MODIFIED COPOLYMER; MODIFIED  
HOMOPOLYMER-NP; MOLECULAR WEIGHT; MONOCARBOXYLIC ACID-A; MONOOLEFINIC-A;  
MONOOLEFINIC MONOMER-AP; \*MOTOR OIL-\*P; MULTICARBOXYLIC ESTER; NITROGEN;  
OLIGOMERIZATION; OPERATING CONDITION; ORGANIC SULFIDE; OTHER OXYGEN

ESTER-P; \*OXIDATION REACTION; OXYGEN-NA; PEROXY-A; PETROLEUM FRACTION;  
PHOSPHORUS CONTAINING ESTER-P; PHYSICAL PROPERTY; POLYAMIDE; POLYCARBONATE  
RESIN; POLYESTER; POLYETHER; POLYMER MODIFIER-A; \*POLYMERIZATION;  
POLYURETHANE; PORE SIZE; POROSITY; POUR POINT; PRIOR TREATMENT; REDUCTION  
REACTION; SATURATED CHAIN-NA; SILICA; SILICON; SINGLE STRUCTURE TYPE-NAP;  
SOLID LUBRICANT; SOLVENT; STABILITY; STRAIGHT CHAIN-AP; SULFUR; SULFUR  
CONTAINING ESTER-P; \*SYNTHETIC LUB/IND OIL-A\*P; SYNTHETIC RESIN;  
TEMPERATURE; TEMPERATURE 125 TO 200 C; TEMPERATURE 200 TO 300 C;  
TEMPERATURE 300 TO 600 C; TEMPERATURE 600 C AND HIGHER; TEMPERATURE 80 TO  
125 C; TERMINAL OLEFINIC-AP; TERMINAL OLEFINIC MONOMER-NP; TERPOLYMER;  
THIOL; TRANSITION TEMPERATURE; UNSATURATED-AP; UNSATURATED CHAIN-AP;  
UNSATURATED CHAIN MONOMER-NAP; UNSATURATED MONOMER; \*USE-NA\*P; VISCOSITY;  
VISCOSITY INDEX; VISCOSITY INDEX IMPROVER; WATER; WEAR RESISTANCE  
LT CHLOROHYDROCARBON; COMPOUNDS; FLUOROHYDROCARBON; HALOHYDROCARBON  
LT COMPOUNDS; POLYESTER  
LT COMPOUNDS; MULTICARBOXYLIC ESTER; POLYCARBONATE RESIN; POLYESTER;  
SYNTHETIC RESIN  
LT COMPOUNDS; POLYURETHANE  
LT CARBOXAMIDE; COMPOUNDS; POLYAMIDE  
LT COMPOUNDS; THIOL  
LT CARBOXAMIDE; CHLOROHYDROCARBON; COMPOUNDS; COPOLYMER; ETHER;  
FLUOROHYDROCARBON; HALOHYDROCARBON; MODIFIED COPOLYMER; POLYAMIDE;  
POLYESTER; POLYETHER; POLYURETHANE; TERMINAL OLEFINIC MONOMER; TERPOLYMER;  
THIOL; UNSATURATED CHAIN MONOMER  
LT C13-16 MONOMER-AP; C17-25 MONOMER-AP; C5-12 MONOMER-AP; COMPOUNDS-AP;  
HOMOPOLYMER-AP; HYDROCARBON-AP; LUBRICANT/INDUSTRIAL OIL-AP; MONOOLEFINIC  
MONOMER-AP; SYNTHETIC LUB/IND OIL-AP; TERMINAL OLEFINIC-AP; UNSATURATED  
CHAIN MONOMER-AP; USE-AP  
LT C26 AND UP-AP; COMPOUNDS-AP; HYDROCARBON-AP; LUBRICANT/INDUSTRIAL OIL-AP;  
SINGLE STRUCTURE TYPE-AP; SYNTHETIC LUB/IND OIL-AP; UNSATURATED-AP;  
UNSATURATED CHAIN-AP; USE-AP  
LT 11118-57-3; 7631-86-9; CATALYST; CHROMIUM; CHROMIUM OXIDE; GROUP IVA;  
GROUP VIA; GROUP VIB; IDE; MICROSTRUCTURE; OXYGEN; PORE SIZE; SILICA;  
SILICON; USE  
LT 7631-86-9; CATALYST SUPPORT; GROUP IVA; GROUP VIA; IDE; OXYGEN; SILICA;  
SILICON; USE  
LT 7722-84-1-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-A;  
OXYGEN-A; POLYMER MODIFIER-A; USE-A  
LT COMPOUNDS-A; MONOCARBOXYLIC ACID-A; PEROXY-A; POLYMER MODIFIER-A;  
SATURATED CHAIN-A; SINGLE STRUCTURE TYPE-A; UNSATURATED-A; UNSATURATED  
CHAIN-A; USE-A  
LT BENZENE RING-A; COMPOUNDS-A; MONOCARBOXYLIC ACID-A; PEROXY-A; POLYMER  
MODIFIER-A; USE-A  
LT BRANCHED CHAIN-P; C11-P; C12-P; C13-16-P; C17-25-P; C26 AND UP-P;  
COMPOUNDS-P; EPOXY-P; LUBRICANT/INDUSTRIAL OIL-P; MOTOR OIL-P; SYNTHETIC  
LUB/IND OIL-P; UNSATURATED CHAIN-P; USE-P  
LT C13-16 MONOMER-P; C17-25 MONOMER-P; C5-12 MONOMER-P; COMPOUNDS-P; EPOXY-P;  
HYDROCARBON-P; LUBRICANT/INDUSTRIAL OIL-P; MODIFIED HOMOPOLYMER-P;  
MONOOLEFINIC MONOMER-P; MOTOR OIL-P; SINGLE STRUCTURE TYPE-P; SYNTHETIC  
LUB/IND OIL-P; TERMINAL OLEFINIC MONOMER-P; UNSATURATED CHAIN MONOMER-P;  
USE-P  
LT BORON ORGANIC-P; C26 AND UP-P; COMPOUNDS-P; ESTER LUBRICANT-P;  
LUBRICANT/INDUSTRIAL OIL-P; MOTOR OIL-P; OTHER OXYGEN ESTER-P; PHOSPHORUS  
CONTAINING ESTER-P; SINGLE STRUCTURE TYPE-P; SULFUR CONTAINING ESTER-P;  
SYNTHETIC LUB/IND OIL-P; UNSATURATED-P; UNSATURATED CHAIN-P; USE-P  
LT BORON ORGANIC-P; C13-16 MONOMER-P; C17-25 MONOMER-P; C5-12 MONOMER-P;  
COMPOUNDS-P; ESTER LUBRICANT-P; HYDROCARBON-P; LUBRICANT/INDUSTRIAL OIL-P;  
MODIFIED HOMOPOLYMER-P; MONOOLEFINIC MONOMER-P; MOTOR OIL-P; OTHER OXYGEN  
ESTER-P; PHOSPHORUS CONTAINING ESTER-P; SINGLE STRUCTURE TYPE-P; SULFUR  
CONTAINING ESTER-P; SYNTHETIC LUB/IND OIL-P; TERMINAL OLEFINIC MONOMER-P;

UNSATURATED CHAIN MONOMER-P; USE-P  
LT INORGANIC SOLVENT; SOLVENT; USE; WATER  
LT 111-66-0-A; 112-41-4-A; 872-05-9-A; 1-DECENE-A; 1-DODECENE-A; 1-OCTENE-A;  
C10-A; C12-A; C8-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE STRUCTURE  
TYPE-A; STRAIGHT CHAIN-A; TERMINAL OLEFINIC-A; UNSATURATED CHAIN-A  
LT C10 MONOMER-P; C12 MONOMER-P; C8 MONOMER-P; COMPOUNDS-P; EPOXY-P;  
HYDROCARBON-P; LUBRICANT/INDUSTRIAL OIL-P; MODIFIED HOMOPOLYMER-P;  
MONOOLEFINIC MONOMER-P; MOTOR OIL-P; SINGLE STRUCTURE TYPE-P; STRAIGHT  
CHAIN-P; SYNTHETIC LUB/IND OIL-P; TERMINAL OLEFINIC MONOMER-P; UNSATURATED  
CHAIN MONOMER-P; USE-P  
LT 12795-06-1; 630-08-0; CARBON; CARBON MONOXIDE; CARBON OXIDE; GROUP IVA;  
GROUP VIA; IDE; OXYGEN  
LT ALKENE-A; C13-16-A; C17-25-A; C5-12-A; COMPOUNDS-A; ELEMENT;  
HYDROCARBON-A; HYDROGEN; MONOOLEFINIC-A; SINGLE STRUCTURE TYPE-A; TERMINAL  
OLEFINIC-A; UNSATURATED CHAIN-A  
LT 7664-41-7; AMMONIA; GROUP VA; HYDROGEN; IDE; NITROGEN  
LT 7783-06-4; GROUP VIA; HYDROGEN; HYDROGEN SULFIDE; IDE; SULFUR  
LT 75-15-0; CARBON; CARBON DISULFIDE; GROUP IVA; GROUP VIA; IDE; SULFUR  
LT 75-18-3; C2; METHYL SULFIDE; ORGANIC SULFIDE; SATURATED CHAIN; SINGLE  
STRUCTURE TYPE  
LT C2; DISULFIDE; ORGANIC SULFIDE; SATURATED CHAIN; SINGLE STRUCTURE TYPE  
LT HYDROGENATION; PRIOR TREATMENT  
LT COMPOUNDS; FLUOROHYDROCARBON; HALOHYDROCARBON; MODIFIED HOMOPOLYMER;  
UNSATURATED MONOMER  
LT COMPOUNDS; HOMOPOLYMER; TERMINAL OLEFINIC MONOMER; UNSATURATED CHAIN  
MONOMER  
LT COMPOUNDS; ETHER; POLYETHER

L110 ANSWER 16 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN  
AN 88:1169 ENCOMPAT;ENCOMPAT2  
DN 8850468  
TI **CATALYST FOR EPOXIDATION OF OLEFIN(S) -**  
COMPRISES QUAT. AMMONIUM SALT OR PEROXIDE.  
PA SAN PETROCHEMICAL K  
PI JP 62234550 871014  
PRAI JP 1985-296226 851224  
JP 1986-228768 860927  
FI JP 62234550 871014  
OS DERWENT 87330292  
CC CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS; OXYGEN COMPOUNDS;  
PETROLEUM REFINING AND PETROCHEM  
CT 12067-99-1; 7722-84-1-A; AGRICULTURE; ARSENIC; ATE; BENZENE RING; BRANCHED  
CHAIN-A; **\*CATALYST**; COMPOUNDS-NAP; \*EPOXIDATION; EPOXY-P; EPOXY  
RESIN; ETHER; FUSED OR BRIDGED RING; GROUP VA; GROUP VIA-NA; GROUP VIB;  
HETEROCYCLIC; HETEROPOLYACID; HYDROCARBON-A; HYDROGEN-NA; HYDROGEN  
PEROXIDE-A; HYDROPHILIC; IDE-A; INTERNAL OLEFINIC-A; MONOAMINE;  
MONOOLEFINIC-NA; MULTIAMINE; MULTIOLEFINIC-NA; NONE; NONHYDROCARBON  
SOLVENT; ORGANIC SALT; ORGANIC SOLVENT; \*OXIDATION REACTION; OXYGEN-NA;  
PEROXY; PHARMACEUTICAL PRODUCT; PHOSPHORUS; PHYSICAL PROPERTY; SATURATED  
CHAIN; SOLVENT; SYNTHETIC RESIN; TUNGSTEN; TUNGSTOPHOSPHORIC ACID;  
UNSATURATED CHAIN-A; \*USE; 5 MEMBER RING; 6 MEMBER RING  
ST B01J-031/02; C07D-301/12  
LT 12067-99-1; ATE; BENZENE RING; CATALYST; COMPOUNDS; ETHER; FUSED OR  
BRIDGED RING; GROUP VA; GROUP VIA; GROUP VIB; HETEROCYCLIC;  
HETEROPOLYACID; HYDROGEN; MONOAMINE; MONOOLEFINIC; MULTIAMINE;  
MULTIOLEFINIC; ORGANIC SALT; OXYGEN; PEROXY; PHOSPHORUS; SATURATED CHAIN;  
TUNGSTEN; TUNGSTOPHOSPHORIC ACID; USE; 5 MEMBER RING; 6 MEMBER RING  
LT 7722-84-1-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN PEROXIDE-A; IDE-A; OXYGEN-A  
LT ARSENIC; ATE; BENZENE RING; CATALYST; COMPOUNDS; ETHER; FUSED OR BRIDGED

RING; GROUP VA; GROUP VIA; GROUP VIB; HETEROCYCLIC; HETEROPOLYACID;  
HYDROGEN; MONOAMINE; MONOOLEFINIC; MULTIAMINE; MULTIOLEFINIC; ORGANIC  
SALT; OXYGEN; PEROXY; SATURATED CHAIN; TUNGSTEN; USE; 5 MEMBER RING; 6  
MEMBER RING  
LT BRANCHED CHAIN-A; COMPOUNDS-A; HYDROCARBON-A; INTERNAL OLEFINIC-A;  
MONOOLEFINIC-A; MULTIOLEFINIC-A; UNSATURATED CHAIN-A  
LT COMPOUNDS-P; EPOXY-P  
LT HYDROPHILIC; NONE; PHYSICAL PROPERTY  
L110 ANSWER 17 OF 18 ENCOMPPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN  
AN 82:6722 ENCOMPPAT;ENCOMPPAT2  
DN 8252551  
TI PURE 1,2-ALKANEGLYCOL PREPN. - BY **EPOXIDATION** OF ALPHA-  
**OLEFIN** IN ORGANIC SOLVENT USING ORGANIC ACID AND HYDROLYSIS OF  
PROD. WITH TERT. ALCOHOL  
PA NIPPON PEROXIDE KK  
PI JP 57062234 820415  
PRAI JP 1980-136767 801002  
FI JP 57062234 820415  
OS DERWENT 8242236E  
CC CHEMICAL PRODUCTS; OXYGEN COMPOUNDS  
CT 108-88-3; 1330-20-7; 1333-74-0-NA; 64-18-6; 64-19-7; 75-09-2; 75-65-0;  
7601-90-3; 7664-93-9; 7697-37-2; 7704-34-9; 7722-84-1-A; 7727-37-9;  
7782-44-7-NA; 7782-50-5; ACETIC ACID; **ACTIVATOR**; ATE; BENZENE  
RING; BRANCHED CHAIN; **\*CATALYST**; CHLORINE; CHLOROHYDROCARBON;  
COMPOUNDS-AP; COSMETIC; C1; C2; C4; C6-A; C7-NA; C8-NA; C9-A;  
DICHLOROMETHANE; DISTILLATION; **\*EPOXIDATION**; EPOXY-AP; FORMIC ACID; GROUP  
VA; GROUP VIA-NA; GROUP VIIA; HALOHYDROCARBON; HYDROCARBON-NA; HYDROCARBON  
SOLVENT; HYDROGEN-NA; HYDROGEN PEROXIDE-A; HYDROLYSIS; IDE-A; LIGROIN;  
MONOCARBOXYLIC ACID; MONOHYDROXY; MONOOLEFINIC-A; **\*MULTIHYDROXY-\*P**; NITRIC  
ACID; NITROGEN; NONHYDROCARBON SOLVENT; OPERATING CONDITION; ORGANIC  
SOLVENT; **\*OXIDATION REACTION**; OXYGEN-NA; PERCHLORIC ACID; PETROLEUM  
SOLVENT; PHYSICAL PROPERTY; PHYSICAL SEPARATION; REACTION TIME; SATURATED  
CHAIN-NAP; SINGLE STRUCTURE TYPE-NAP; SOLUBILITY; SOLVENT; SOLVOLYSIS;  
SULFUR; SULFURIC ACID; SURFACE ACTIVE AGENT; TERT-BUTYL ALCOHOL; TOLUENE;  
UNSATURATED CHAIN-A; WATER SOLUBILITY; XYLENE  
LT COMPOUNDS-AP; EPOXY-AP; SATURATED CHAIN-AP  
LT 1333-74-0-A; 7722-84-1-A; 7782-44-7-A; GROUP VIA-A; HYDROGEN-A; HYDROGEN  
PEROXIDE-A; IDE-A; OXYGEN-A  
LT 64-18-6; 64-19-7; ACETIC ACID; ACTIVATOR; C1; C2; FORMIC ACID;  
MONOCARBOXYLIC ACID; SATURATED CHAIN; SINGLE STRUCTURE TYPE  
LT 1333-74-0; 7664-93-9; 7704-34-9; 7782-44-7; ATE; CATALYST; GROUP VIA;  
HYDROGEN; OXYGEN; SULFUR; SULFURIC ACID  
LT 1333-74-0; 7601-90-3; 7782-44-7; 7782-50-5; ATE; CATALYST; CHLORINE; GROUP  
VIA; GROUP VIIA; HYDROGEN; OXYGEN; PERCHLORIC ACID  
LT 1333-74-0; 7697-37-2; 7727-37-9; 7782-44-7; ATE; CATALYST; GROUP VA; GROUP  
VIA; HYDROGEN; NITRIC ACID; NITROGEN; OXYGEN  
LT 108-88-3; 1330-20-7; BENZENE RING; C7; C8; HYDROCARBON; HYDROCARBON  
SOLVENT; ORGANIC SOLVENT; SATURATED CHAIN; SOLVENT; TOLUENE; XYLENE  
LT 75-65-0; BRANCHED CHAIN; C4; MONOHYDROXY; NONHYDROCARBON SOLVENT; ORGANIC  
SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE TYPE; SOLVENT; TERT-BUTYL  
ALCOHOL  
LT 75-09-2; CHLOROHYDROCARBON; C1; DICHLOROMETHANE; HALOHYDROCARBON;  
NONHYDROCARBON SOLVENT; ORGANIC SOLVENT; SATURATED CHAIN; SINGLE STRUCTURE  
TYPE; SOLVENT  
LT COMPOUNDS-P; MULTIHYDROXY-P; SATURATED CHAIN-P; SINGLE STRUCTURE TYPE-P  
LT COMPOUNDS-A; C6-A; C7-A; C8-A; C9-A; HYDROCARBON-A; MONOOLEFINIC-A; SINGLE  
STRUCTURE TYPE-A; UNSATURATED CHAIN-A

L110 ANSWER 18 OF 18 ENCOMPAT2 COPYRIGHT 2003 ELSEVIER ENGINEERING  
INFORMATION INC. on STN  
AN 72:1131 ENCOMPAT;ENCOMPAT2  
DN 7200410S  
TI **OLEFIN EPOXIDATION** - WITH MOLECULAR OXYGEN AND NITRILE  
(CO) SOLVENT  
PA INSTITUT FRANCAIS DU PETROLE DES CAR  
PI FR 2070406 710910  
PRAI FR 1969-41807 691203  
FI FR 2070406 710910  
OS DERWENT 7179311S  
CC CHEMICAL PRODUCTS; CHEMICALS-PROCESSING CATALYSTS; OXYGEN COMPOUNDS  
CT 100-47-0; 7439-98-7; 7440-32-6; 7440-33-7; 7440-62-2; 75-05-8;  
7782-44-7-A; 9002-84-0; 9003-17-2-A; ACETONITRILE; ALLOY; BENZENE  
RING-NAP; BENZONITRILE; BRANCHED CHAIN-AP; **CATALYST**; CHELATE;  
COATING MATERIAL; COMPLEX; COMPOUNDS-NAP; CONSTRUCTION MATERIAL; C2; C2  
MONOMER; C4 MONOMER-AP; C7; ELEMENT-A; \*EPOXIDATION; EPOXY-P; ETHER;  
FLUID; **FLUOROHYDROCARBON**; GLASS; GROUP IVB; GROUP VB; GROUP  
VIA-A; GROUP VIB; HALOHYDROCARBON; HOMOPOLYMER-NA; HYDROCARBON-AP; IFP;  
LIQUID; MODIFIED HOMOPOLYMER-P; MOLYBDENUM; MONOCARBOXYLIC ESTER;  
MONOHYDROXY; MONOOLEFINIC MONOMER; MULTICARBOXYLIC ESTER; MULTIHIDROXY;  
MULTIOLEFINIC MONOMER-AP; NITRILE; NONFERROUS ALLOY; NONHYDROCARBON  
SOLVENT; OLEFIN-A; OPERATING CONDITION; \*OXIDATION REACTION; OXYGEN-A;  
REACTOR; SATURATED CARBOCYCLIC-NAP; SATURATED CHAIN-NAP; SINGLE STRUCTURE  
TYPE-NAP; SOLVENT; STRAIGHT CHAIN-AP; TERMINAL OLEFINIC MONOMER-NAP;  
TETRAFLUROETHYLENE HOMOPOLYMER; TITANIUM; TUNGSTEN; UNSATURATED-NA;  
UNSATURATED CARBOCYCLIC-NA; UNSATURATED CHAIN-NA; UNSATURATED CHAIN  
MONOMER-NAP; VANADIUM; WALL; YIELD; 1,3-BUTADIENE HOMOPOLYMER-A  
LT COATING MATERIAL; GLASS  
LT COMPOUNDS; ETHER; MONOCARBOXYLIC ESTER; MONOHYDROXY; MULTICARBOXYLIC  
ESTER; MULTIHIDROXY; NONHYDROCARBON SOLVENT; SOLVENT  
LT 9002-84-0; CONSTRUCTION MATERIAL; C2 MONOMER; FLUOROHYDROCARBON;  
HALOHYDROCARBON; HOMOPOLYMER; MONOOLEFINIC MONOMER; SINGLE STRUCTURE TYPE;  
TERMINAL OLEFINIC MONOMER; TETRAFLUROETHYLENE HOMOPOLYMER; UNSATURATED  
CHAIN MONOMER  
LT 9003-17-2-A; C4 MONOMER-A; HOMOPOLYMER-A; HYDROCARBON-A; MULTIOLEFINIC  
MONOMER-A; SINGLE STRUCTURE TYPE-A; STRAIGHT CHAIN-A; TERMINAL OLEFINIC  
MONOMER-A; UNSATURATED CHAIN MONOMER-A; 1,3-BUTADIENE HOMOPOLYMER-A  
LT C4 MONOMER-P; EPOXY-P; HYDROCARBON-P; MODIFIED HOMOPOLYMER-P;  
MULTIOLEFINIC MONOMER-P; SINGLE STRUCTURE TYPE-P; STRAIGHT CHAIN-P;  
TERMINAL OLEFINIC MONOMER-P; UNSATURATED CHAIN MONOMER-P  
LT 7782-44-7-A; ELEMENT-A; GROUP VIA-A; OXYGEN-A  
LT 75-05-8; ACETONITRILE; C2; NITRILE; NONHYDROCARBON SOLVENT; SATURATED  
CHAIN; SINGLE STRUCTURE TYPE; SOLVENT  
LT 7440-32-6; ALLOY; CONSTRUCTION MATERIAL; GROUP IVB; NONFERROUS ALLOY;  
TITANIUM  
LT BENZENE RING; COMPOUNDS; NITRILE; NONHYDROCARBON SOLVENT; SATURATED  
CARBOCYCLIC; SATURATED CHAIN; SOLVENT; UNSATURATED; UNSATURATED  
CARBOCYCLIC; UNSATURATED CHAIN  
LT 100-47-0; BENZENE RING; BENZONITRILE; C7; NITRILE; NONHYDROCARBON SOLVENT;  
SINGLE STRUCTURE TYPE; SOLVENT  
LT BENZENE RING-A; BRANCHED CHAIN-A; COMPOUNDS-A; HYDROCARBON-A; OLEFIN-A;  
SATURATED CARBOCYCLIC-A; SATURATED CHAIN-A; UNSATURATED-A; UNSATURATED  
CARBOCYCLIC-A; UNSATURATED CHAIN-A  
LT BENZENE RING-P; BRANCHED CHAIN-P; COMPOUNDS-P; EPOXY-P; SATURATED  
CARBOCYCLIC-P; SATURATED CHAIN-P  
LT 7440-62-2; CATALYST; CHELATE; COMPLEX; COMPOUNDS; GROUP VB; VANADIUM  
LT 7439-98-7; CATALYST; CHELATE; COMPLEX; COMPOUNDS; GROUP VIB; MOLYBDENUM  
LT 7440-33-7; CATALYST; CHELATE; COMPLEX; COMPOUNDS; GROUP VIB; TUNGSTEN

=> file wpix, japio  
FILE 'WPIX' ENTERED AT 11:54:43 ON 28 JUL 2003  
COPYRIGHT (C) 2003 THOMSON DERWENT

FILE 'JAPIO' ENTERED AT 11:54:43 ON 28 JUL 2003  
COPYRIGHT (C) 2003 Japanese Patent Office (JPO)- JAPIO

=> d L138 1-28 all

L138 ANSWER 1 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2003-465722 [44] WPIX

DNC C2003-124130

TI Porous particulate dual-functional **catalyst** for **olefin epoxidation**, includes **catalytic** substrate material comprising **olefin epoxidation catalyst(s)**, and nanometer-sized crystallites of noble metal(s).

DC E13 E36

IN RUETER, M; ZHOU, B

PA (HYDR-N) HYDROCARBON TECHNOLOGIES INC

CYC 1

PI US 6534661 B1 20030318 (200344)\* 11p B01J029-89

ADT US 6534661 B1 Provisional US 2000-258535P 20001228, US 2001-996920 20011130

PRAI US 2000-258535P 20001228; US 2001-996920 20011130

IC ICM B01J029-89

ICS B01J029-068; C01B015-029; C07D301-03; C07D301-12

AB US 6534661 B UPAB: 20030710

NOVELTY - A porous particulate dual-functional **catalyst** for the selective combined in-situ production of hydrogen peroxide concurrent with epoxidation of olefins, includes a **catalytic** substrate material comprising olefin epoxidation **catalyst(s)**, and nanometer-sized crystallites of noble metal(s) deposited on a portion of substrate surface.

DETAILED DESCRIPTION - A porous particulate dual-functional **catalyst** for the selective combined in-situ production of hydrogen peroxide concurrent with epoxidation of olefins, includes a **catalytic** substrate material comprising olefin epoxidation **catalyst(s)**, and nanometer-sized crystallites of noble metal(s) deposited on a portion of substrate surface. At least the face of the crystallites includes an exposition of 110-220 series of crystal planes.

INDEPENDENT CLAIMS are also included for:

(a) a method for preparing a porous particulate dual-function **catalyst** comprising preparing a dilute acid solution containing noble metal salt including a palladium salt alone or in combination with a minor amount of salts of platinum, gold, iridium, osmium, rhodium or ruthenium; mixing water-soluble noble metal complexing and dispersing polymer(s) into the dilute acid solution, and reducing the mixed solution to form reduced and dispersed noble metal-polymer complex; adding particulate **catalytic** substrate to the reduced solution to impregnate the substrate with the noble metal portion of the reduced mixed solution; recovering and drying the impregnated substrate; and reducing the impregnated substrate with hydrogen to produce the dual-function **catalyst**; and

(b) a method for the epoxidation of olefins simultaneously with the selective generation of hydrogen peroxide comprising concurrently contacting **feedstreams** comprising hydrogen, oxygen and olefins in a solvent in a reactor vessel (16) containing particulate dual-functional **catalyst** (17) to produce a **reactor** effluent **stream** (19) containing unreacted gaseous components,

particulate **catalyst**, unconverted liquid olefins, olefins epoxides, solvent and water; and separating the **reactor** effluent **stream** to recover the olefin epoxide product (41) and recover the particulate **catalyst**, unreacted olefin, unreacted hydrogen, unreacted oxygen and solvent.

USE - The invention is used for the selective combined in-situ production of hydrogen peroxide from hydrogen and oxygen concurrent with the epoxidation of olefins, e.g. propylene.

ADVANTAGE - The invention has high activity, stable structure, and long life. It has:

(1) high overall selectivity of propylene oxide formation, greater than 90% with respect to hydrogen feed consumed, and with respect to propylene feed consumed;

(2) greatly reduced capital cost because of reduction in major equipment resulting from the single reaction step and the reduced number of separations required to prepare the hydrogen peroxide intermediate;

(3) formation of only water as a by-product;

(4) safe operation resulting from hydrogen concentration being maintained below the flammability limit; and

(5) safe operation owing to the in-situ reaction of peroxide intermediate, eliminating any need to isolate, purify, or handle peroxide compounds outside of the reactor.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic flow sheet of integrated process for the production of propylene oxide and the dual-functional **catalyst**.

Reactor vessel 16

Dual-functional **catalyst** 17

Reactor effluent stream 19

Olefin epoxide product 41

Dwg.2/2

FS CPI

FA AB; GI; DCN

MC CPI: E07-A03A; E31-E; N01-D01; N02-E; N02-F; N03-B01; N03-C01; N03-C03; N03-G; N06-B; N06-E01; N07-B; N07-C01

L138 ANSWER 2 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2003-402831 [38] WPIX

CR 2003-316048 [31]

DNC C2003-107097

TI **Catalytic epoxidation of olefins** with hydrogen peroxide involves passing mixture comprising liquid phase(s) through fixed **catalyst** bed between parallel heat exchange plates, and partially removing cooking medium.

DC E13

IN HOFEN, W; THIELE, G

PA (HOFE-I) HOFEN W; (THIE-I) THIELE G; (DEGS) DEGUSSA AG; (UHDE) UHDE GMBH

CYC 100

PI WO 2003016296 A2 20030227 (200338)\* EN 21p C07D301-12

RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU  
MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW

W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK  
DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR  
KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT  
RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW

US 2003040636 A1 20030227 (200338) C07D301-12

ADT WO 2003016296 A2 WO 2002-EP8608 20020802; US 2003040636 A1 Provisional US 2001-312065P 20010815, US 2002-222343 20020815

PRAI EP 2001-119565 20010816; US 2001-312065P 20010815; US 2002-222343 20020815

IC ICM C07D301-12



AB WO2003016296 A UPAB: 20030616

NOVELTY - **Catalytic** epoxidation of olefins with hydrogen peroxide in a continuous flow reaction system, comprises passing a reaction mixture comprising a liquid phase(s) through a fixed **catalyst** bed positioned between parallel heat exchange plates, and partially removing a cooling medium during the course of reaction by passing through the heat exchange plates.

USE - For the **catalytic** epoxidation of olefins, e.g. propene, with hydrogen peroxide (claimed).

ADVANTAGE - The invention achieves an optimized balance between hydrogen peroxide conversion and olefin oxide selectivity, and allows a uniform feed of the liquid to the reaction mixture to the **catalyst** bed.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: E07-A03A; E11-E; N03-B01; N07-C

L138 ANSWER 3 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2003-316048 [31] WPIX

CR 2003-402831 [38]

DNC C2003-083183

TI **Catalytic epoxidation of olefins** with

hydrogen peroxide in continuous flow reaction system, where reaction heat is at least partially removed during reaction by passing cooling medium through heat exchange plates.

DC E13

IN HOFEN, W; THIELE, G

PA (DEGS) DEGUSSA AG; (UHDE) UHDE GMBH

CYC 26

PI EP 1285915 A1 20030226 (200331)\* EN 12p C07D301-12

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
RO SE SI TR

ADT EP 1285915 A1 EP 2001-119565 20010816

PRAI EP 2001-119565 20010816

IC ICM C07D301-12

AB EP 1285915 A UPAB: 20030616

NOVELTY - In the **catalytic** epoxidation of olefins with hydrogen peroxide in a continuous flow reaction system, the reaction mixture, comprising at least one liquid phase, is passed through a fixed **catalyst** bed positioned between parallel heat exchange plates. The reaction heat is at least partially removed during the course of the reaction by passing a cooling medium through the heat exchange plates.

USE - The process is particularly used for the epoxidation of propene (claimed).

ADVANTAGE - The process results in improved conversion and product selectivity compared to WO97/47614 while avoiding the disadvantages of EP659473 and US5849937 (complexity, increased costs and the high susceptibility to changes of process parameters like flow velocity due to the adiabatically operated independent reaction zones and reactors respectively). By using a reactor with a bundle of parallel heat exchange plates, where the **catalyst** is positioned between the plates, the process can be conducted with high olefin oxide selectivity at high hydrogen peroxide conversion compared to tubular reactors with a cooling jacket. Compared to tube bundle reactors the dimensions of the plate bundle reactor are reduced at the same space-time yield. Thus investment costs are lower. Also, the reactor to be used is less susceptible to blocking and fouling compared to tube bundle reactors. By selecting such a narrowly defined temperature profile within the reactor an optimized balance between hydrogen peroxide conversion and olefin oxide selectivity

can be achieved. A cooled fixed bed reactor can be successfully operated in a down-flow operation to increase product selectivity and thereby overall product yield compared to an up-flow operation as previously used in the prior art. A uniform feed of the liquid reaction mixture to the **catalyst** bed is more easily accomplished. Compared to tube bundle reactors, the plate bundle reactor has flow channels for the reaction mixture between the heat exchange plates that are much larger in traverse direction. This means that the reaction mixture has to be supplied only to a few locations along the width of one single flow channel to ensure uniform flow within the reactor. Also standard equipment used for liquid distribution in distillation columns can be used to feed the reaction mixture to the individual **catalyst** layers between the heat exchange plates.

Dwg.0/0

FS

CPI

FA

AB; DCN

MC

CPI: E07-A03; N03-B01; N06-B01; N07-C

L138 ANSWER 4 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2003-278640 [27] WPIX

DNC C2003-072951

TI Working up of product stream from **epoxidation of olefins** involves carrying out separation of product stream into overhead and bottom products at specified pressure.

DC E13

IN HAAS, T; HOFEN, W; THIELE, G; WOELL, W; WOLL, W

PA (DEGS) DEGUSSA AG; (UHDE) UHDE GMBH; (HAAS-I) HAAS T; (HOFE-I) HOFEN W; (THIE-I) THIELE G; (WOLL-I) WOLL W

CYC 102

PI WO 2003018567 A1 20030306 (200327)\* EN 27p C07D301-12

RW: AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU  
MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW

W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK  
DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR  
KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT  
RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA ZM  
ZW

EP 1293505 A1 20030319 (200327) EN C07D301-12

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
RO SE SI TR

US 2003040637 A1 20030227 (200342)# 10p C07D301-32

ADT WO 2003018567 A1 WO 2002-EP9210 20020817; EP 1293505 A1 EP 2001-120165  
20010822; US 2003040637 A1 Provisional US 2001-314165P 20010823, US  
2002-226766 20020823

PRAI EP 2001-120165 20010822; US 2002-226766 20020823

IC ICM C07D301-12; C07D301-32

ICS C07D301-32

AB WO2003018567 A UPAB: 20030429

NOVELTY - A product stream from the epoxidation of olefins that contains olefin, olefin oxide, water-miscible organic solvent, hydrogen peroxide and water, is worked-up by separating the product stream into an overhead product and a bottom product, in a pre-evaporator with less than 10 theoretical separation stages at a pressure of 1.5 to less than 3 bar.

DETAILED DESCRIPTION - Working up of a product stream from the epoxidation of olefins that contains olefin, olefin oxide, water-miscible organic solvent, hydrogen peroxide and water, includes separating the product stream into an overhead product containing olefin, olefin oxide and organic solvent, and into a bottom product containing organic solvent, hydrogen peroxide and water, in a pre-evaporator with less than 10 theoretical separation stages. 20-60% of the total amount of organic

solvent introduced with the product stream is removed with the overhead product and the balance remains in the bottom product. The separation is carried out at a pressure of 1.5 to less than 3 bar.

An INDEPENDENT CLAIM is included for a process for the **catalytic** epoxidation of olefins in which a reaction step is reacted with an aqueous hydrogen peroxide in an organic water-miscible solvent in the presence of a titanium silicalite **catalyst**. The product **stream** from the **reaction** step is optionally fed to a pressure release step. It is then worked up, without prior distillative separation, according to the above process.

USE - For working up of a product stream from the epoxidation of olefins that contains olefin, olefin oxide, water-miscible organic solvent, hydrogen peroxide and water.

ADVANTAGE - The process provides a shorter duration in the working up of the thermal stresses to which the olefin oxide is subjected in the presence of water and other potential reactants. It significantly reduces the loss of olefin oxide by secondary reactions and the decomposition of unreacted hydrogen peroxide in the working up. It achieves the separation of the propene oxide from methanol and water with smaller reflux ratios in the columns than in the prior art, thus leading to savings in operating costs. It can return the methanol-water mixture obtained in the bottom of the column as a solvent directly to the epoxidation process, with the result that no separate distillation column is required to recover the extraction agent. It separates the propene oxide from the reaction mixture before the recovery of the **catalyst**. It provides considerable savings in the necessary industrial safety measures due to the solid/liquid separation in the absence of the carcinogenic propene oxide. It provides the possibility to use an integrated heat management to improve energy efficiency.

Dwg.0/1

FS

CPI

FA

AB; GI; DCN

MC

CPI: E07-A03B; E11-Q01; N03-B01; N06-C05; N07-C

L138 ANSWER 5 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2003-021130 [02] WPIX

DNC C2003-005355

TI Process for **catalytic epoxidation of olefins**

, involves passing reaction mixture comprising **olefin** and hydrogen peroxide through fixed **catalyst** bed in down-flow operation mode and partially removing formed heat.

DC E13

IN HAAS, T; HOFEN, W; SAUER, J; THIELE, G

PA (DEGS) DEGUSSA AG; (UHDE) UHDE GMBH

CYC 100

PI EP 1247805 A1 20021009 (200302)\* EN 11p C07D301-12

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
RO SE SI TR

WO 2002085873 A1 20021031 (200302) EN C07D301-12

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ  
NL OA PT SD SE SL SZ TR TZ UG ZM ZW

W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK  
DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR  
KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT  
RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW

ADT EP 1247805 A1 EP 2001-105247 20010305; WO 2002085873 A1 WO 2002-EP2286  
20020304

PRAI EP 2001-105247 20010305

IC ICM C07D301-12

AB EP 1247805 A UPAB: 20030111

NOVELTY - A process for the **catalytic** epoxidation of olefins with hydrogen peroxide in a continuous flow reaction system, involves passing the reaction mixture through a fixed **catalyst** bed in down-flow operation mode and partially removing the heat during the course of the reaction.

USE - For epoxidation of olefins e.g. propene into propene oxide.

ADVANTAGE - The down-flow operation mode provides better product selectivity at the same conversion compared to up flow operation mode. Increased propene oxide selectivity is observed, as trickle bed state is maintained under certain flow conditions.

Dwg.0/0

FS

CPI

FA

AB; DCN

MC

CPI: E07-A03A; E11-A; E11-E; E31-E; N03-B01; N06-B; N06-C05; N07-C

L138 ANSWER 6 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2002-693308 [75] WPIX

DNC C2002-196097

TI

**Catalytic epoxidation of olefins** with hydrogen peroxide, where reaction mixture is passed through fixed **catalyst** bed within reactor equipped with cooling device, while maintaining specified temperatures of cooling medium and **catalyst** bed.

DC

E13

IN

HAAS, T; HOFEN, W; SAUER, J; THIELE, T; THIELE, G

PA

(DEGS) DEGUSSA AG; (UHDE) UHDE GMBH

CYC

100

PI

EP 1247806 A1 20021009 (200275)\* EN 8p C07D301-12

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
RO SE SI TR

WO 2002085872 A1 20021031 (200282) EN C07D301-12

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ  
NL OA PT SD SE SL SZ TR TZ UG ZM ZW

W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK  
DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR  
KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT  
RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VN YU ZA ZM ZW

ADT EP 1247806 A1 EP 2001-105249 20010305; WO 2002085872 A1 WO 2002-EP2271  
20020302

PRAI EP 2001-105249 20010305

IC

ICM C07D301-12

AB

EP 1247806 A UPAB: 20021120

NOVELTY - **Catalytic** epoxidation of olefins with hydrogen peroxide uses a continuous flow reaction system. The reaction mixture is passed through a fixed **catalyst** bed within a reactor equipped with cooling device, while maintaining a temperature profile within the reactor so that the cooling medium temperature of the cooling device is at least 40 deg. C and the maximum temperature within the **catalyst** bed is 60 deg. C.

USE - The process is particularly suitable for the epoxidation of propene to propene oxide (claimed).

ADVANTAGE - The process allows for the epoxidation of olefins with high hydrogen peroxide conversion and product selectivity at low investment costs. An optimized balance of conversion and product selectivity is achieved within the narrow limits of cooling medium temperature and maximum temperature in the **catalyst** bed. This can be achieved with a standard reaction system.

Dwg.0/0

FS

CPI

FA

AB; DCN

MC CPI: E07-A03A; E11-E; N01-D02; N03-B01; N06-B; N07-C01

L138 ANSWER 7 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2001-184324 [19] WPIX

DNC C2001-055390

TI Continuous preparation of an **olefin** oxide useful as an intermediate e.g. for the production of glycol involves the **epoxidation** of the **olefin** in the presence of a zeolite containing titanium atoms and a nitrogenated base.

DC E13

IN FORLIN, A; PAPARATTO, G; TEGON, P

PA (ENIE) ENICHEM SPA

CYC 26

PI EP 1072599 A1 20010131 (200119)\* EN 10p C07D301-12

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
RO SE SI

JP 2001097965 A 20010410 (200128) 6p C07D301-12

IT 1313571 B 20020909 (200305) C07D301-00

ADT EP 1072599 A1 EP 2000-202657 20000724; JP 2001097965 A JP 2000-225756  
20000726; IT 1313571 B IT 1999-MI1657 19990727

PRAI IT 1999-MI1657 19990727

IC ICM C07D301-00; C07D301-12

ICS C07D303-04

ICA C07B061-00

AB EP 1072599 A UPAB: 20010405

NOVELTY - Continuous preparation of an olefin oxide involves direct epoxidation of an olefin (preferably propylene) with **hydrogen peroxide** or compounds producing **hydrogen peroxide** in a solvent medium, in the presence of a **catalytic** system. The system consists of a zeolite containing titanium atoms and a nitrogenated base.

DETAILED DESCRIPTION - A continuous preparation of olefin oxide involves direct epoxidation of an olefin with **hydrogen peroxide** or compound producing **hydrogen peroxide** in a solvent medium, in the presence of a **catalytic** system. The system consists of a zeolite containing titanium atoms and a nitrogenated base of formula

$RN(R_1)(R_2)$  or  $-C(R_4)(R_5)(CH_2)nOH$ .

R, R<sub>1</sub> and R<sub>2</sub> = H, 1-10C alkyl or -COR<sub>3</sub>;

R<sub>3</sub> = 1-10C alkyl;

n = 1 - 10;

R<sub>4</sub>, R<sub>5</sub> = H, 1-10C alkyl such that R, R<sub>1</sub> and R<sub>2</sub> are not H.

USE - In the preparation of epoxides or olefin oxides which are used as intermediate for the production of glycols, condensation polymers such as polyester, for the preparation of intermediates useful in the synthesis of polyurethane foams, elastomers and seals.

ADVANTAGE - The quantity of the **catalyst** used in the preparation is not critical and is selected in such a way to allow the epoxidation reaction to be completed in a short time. The process allows high conversions and selectivities of the olefin into the corresponding oxide with a **catalytic** activity stable over a period of time. It avoids problems arising from a technical and economical point of view.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: E06-A02D; E06-A03; E07-A03A; N03-B01; N05-D; N06-B01

L138 ANSWER 8 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2000-146459 [13] WPIX

DNC C2000-045758

TI Selective **epoxidation** of non-allylic **olefins** in presence of fluorinated hydrocarbons.

DC E13

IN BARNICKI, S D; MONNIER, J R

PA (EACH) EASTMAN CHEM CO

CYC 23

PI US 6011163 A 20000104 (200013)\* 9p C07D301-10

WO 2000071530 A1 20001130 (200064) EN C07D301-10

RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

W: BR JP SG

EP 1178978 A1 20020213 (200219) EN C07D301-10

R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

JP 2003500400 W 20030107 (200314) 28p C07D301-10

ADT US 6011163 A US 1999-315107 19990520; WO 2000071530 A1 WO 2000-US9308 20000407; EP 1178978 A1 EP 2000-923166 20000407, WO 2000-US9308 20000407; JP 2003500400 W JP 2000-619787 20000407, WO 2000-US9308 20000407

FDT EP 1178978 A1 Based on WO 200071530; JP 2003500400 W Based on WO 200071530

PRAI US 1999-315107 19990520

IC ICM C07D301-10

ICS C07D303-04

AB US 6011163 A UPAB: 20000313

NOVELTY - A process for the selective epoxidation of non-allylic hydrocarbons comprises contacting a gas mixture comprising a non-allylic olefin, oxygen, and a fluorinated hydrocarbon with a silver epoxidation **catalyst** at conditions effective to epoxidize the non-allylic olefin.

DETAILED DESCRIPTION - The fluorinated hydrocarbon has a C-F bond dissociation energy of 110 kcal/mole or greater, and sufficiently non-acidic C-H bonds, if present, so as to avoid abstraction of **hydrogen** fluoride from the fluorinated hydrocarbon under reaction conditions.

USE - The process is used for the epoxidation of ethylene and 1,3-butadiene.

ADVANTAGE - The use of fluorinated hydrocarbons, instead of diluent hydrocarbons, in epoxidation feed gases increases the maximum safe oxygen concentration, allowing the use of higher oxygen levels than possible with hydrocarbon diluents, while maintaining operation outside of the flammability envelope. The reactor is also rendered more isothermal as the fluorinated hydrocarbon compounds have high heat capacities than methane, nitrogen and other common diluents. The process is safer since flammable hydrocarbons are replaced by non-flammable fluorinated hydrocarbon compounds.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: E07-A03B; E10-H04A3; N02-E03

L138 ANSWER 9 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 2000-089515 [08] WPIX

DNC C2000-025052

TI Manganese **catalyst** for **epoxidation** and dihydroxylation of **olefins**.

DC E19

IN DE VOS, D E J E; DE WILDEMAN, S M A; JACOBS, P A

PA (KULE-N) KU LEUVEN RES & DEV; (LEUV-N) LEUVEN RES & DEV

CYC 87

PI EP 970951 A1 20000112 (200008)\* EN 10p C07D301-12

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT

RO SE SI

WO 2000002872 A1 20000120 (200012) EN C07D301-12

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL  
OA PT SD SE SL SZ UG ZW

W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB  
GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU  
LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR  
TT UA UG US UZ VN YU ZA ZW

AU 9945118 A 20000201 (200028) C07D301-12

ADT EP 970951 A1 EP 1998-202315 19980709; WO 2000002872 A1 WO 1999-EP4048  
19990608; AU 9945118 A AU 1999-45118 19990608

FDT AU 9945118 A Based on WO 200002872

PRAI EP 1998-202315 19980709

IC ICM C07D301-12

ICS B01J031-18; C07C029-04; C07C029-48; C07D301-02

AB EP 970951 A UPAB: 20000215

NOVELTY - A new manganese-containing **catalyst** (I) comprises a substituted triazacycloalkane ligand covalently linked to a support.

DETAILED DESCRIPTION - A manganese-containing **catalyst** of formula (I) is new.

(LMnXn)S (I)

L = a triazacycloalkane comprising at least 6 C atoms, substituted on 2 of the 3 N atoms by a non-coordinating substituent, and comprising a covalent link to a support S;

X = an anion selected from Cl-, Br-, F-, I-, CN-, NCS-, N3-, ClO4-, NO3-, RCOO-, RO-, OH-, O22-, O2-, OOH-, SO42-, HSO4-, PO43-, HPO42-, H2PO4-, RSO3-, RSO4-, B4O72-, oxalate, fumarate, maleate, PF6- and BF4-; n = 0-4; and

S = a solid support, linked to L by a covalent tether, selected from oxides, mixed oxides, zeolites, clays, (in)soluble organic polymers and mixed organic-inorganic solids.

INDEPENDENT CLAIMS are also included for:

(1) A method of preparing the **catalyst** containing a 1,4-disubstituted 1,4,7-triazacyclononane ligand.

(2) A method for epoxidation of an olefin with an oxidizing agent.

(3) A method for forming a vicinal diol (particularly cis-hydroxylation) from an olefin and an oxidizing agent.

USE - The **catalyst** is used in the epoxidation and/or dihydroxylation of olefins (claimed).

ADVANTAGE - Yield, conversion and cis selectivity are improved compared to known **catalysts**.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: E05-L03A; E07-A03A; E10-B03B; E10-E04B; E10-E04F; N05-B; N05-C; N06-E

L138 ANSWER 10 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1999-611525 [53] WPIX

DNC C1999-178208

TI Preparation of **olefinic epoxides**, for use in the production of glycols and synthetic intermediates.

DC A41 E13 G04

IN ARCA, V; FURLAN, P

PA (ENIE) ENICHEM SPA

CYC 2

PI BE 1011375 A6 19990803 (199953)\* 19p C07D000-00

IT 1284930 B 19980528 (200011) C07D000-00

ADT BE 1011375 A6 BE 1997-790 19971001; IT 1284930 B IT 1996-MI2073 19961008

PRAI IT 1996-MI2073 19961008

IC ICM C07D000-00

ICS B01J000-00

AB BE 1011375 A UPAB: 19991215

NOVELTY - The epoxidation with **hydrogen peroxide** is effected in the presence of a titania-silicalite **catalyst** which has been subjected to a thermal pretreatment.

DETAILED DESCRIPTION - The preparation of the olefin epoxide is carried out by the reaction between the olefin and **hydrogen peroxide**, or a substance producing **hydrogen peroxide** in the reaction conditions, in the presence of a

titania-silicalite which has been heat treated to 650 - 1000 deg. C.

USE - The epoxides are intermediates used in a large variety of preparations, particularly glycols, condensation polymers such as polyesters and in the synthesis of polyurethane foams, elastomers and similar products.

ADVANTAGE - The **catalyst** used in the reaction enables good selectivities to be obtained. Contrary to previous **catalysts**, solvolytic reactions are avoided and side reactions with ring opening. At the end of the reaction, the **catalyst** and non-reacted products, olefin and **H2O2**, can be recovered and reused.

Dwg.0/0

FS

CPI

FA

AB; GI; DCN

MC

CPI: A01-E07; E07-A03A; E07-A03B; G04-B; N01-D02; N03-B01

L138 ANSWER 11 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1999-069821 [06] WPIX

DNC C1999-020537

TI

**Olefin epoxidation** operation method, giving improved **catalyst** consumption - by feeding an **olefin** and an active oxygen species through a series of fixed bed **catalyst** reactors and replacing or reactivating the **catalyst** sequentially.

DC

E13 J04

IN

DANNER, J B; JUBIN, J C

PA

(ATLF) ARCO CHEM TECHNOLOGY LP; (ATLF) ARCO CHEM TECHNOLOGIE NEDERLAND BV

CYC

83

PI

US 5849937 A 19981215 (199906)\* 9p C07D301-12

WO 9932472 A1 19990701 (199933) EN C07D301-14

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL  
OA PT SD SE SZ UG ZW

W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD  
GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD  
MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA  
UG UZ VN YU ZW

AU 9910260 A 19990712 (199950) C07D301-14

EP 1047681 A1 20001102 (200056) EN C07D301-14

R: BE DE ES FR GB IT NL

BR 9813834 A 20001121 (200065) C07D301-14

CN 1282328 A 20010131 (200131) C07D301-14

KR 2001033353 A 20010425 (200164) C07D301-14

MX 2000005986 A1 20010101 (200166) C07D301-14

JP 2001526280 W 20011218 (200203) 26p C07D301-14

RU 2205181 C2 20030527 (200347) C07D301-14

ADT US 5849937 A US 1997-995239 19971219; WO 9932472 A1 WO 1998-EP6059

19980923; AU 9910260 A AU 1999-10260 19980923; EP 1047681 A1 EP

1998-952631 19980923; WO 1998-EP6059 19980923; BR 9813834 A BR 1998-13834

19980923; WO 1998-EP6059 19980923; CN 1282328 A CN 1998-812228 19980923;

KR 2001033353 A KR 2000-706818 20000619; MX 2000005986 A1 MX 2000-5986

20000616; JP 2001526280 W WO 1998-EP6059 19980923, JP 2000-525409

19980923; RU 2205181 C2 WO 1998-EP6059 19980923, RU 2000-115957 19980923

FDT AU 9910260 A Based on WO 9932472; EP 1047681 A1 Based on WO 9932472; BR

9813834 A Based on WO 9932472; JP 2001526280 W Based on WO 9932472; RU



2205181 C2 Based on WO 9932472

PRAI US 1997-995239 19971219

IC ICM C07D301-12; C07D301-14

ICS C07B061-00; C07D301-04; C07D301-19

AB US 5849937 A UPAB: 19990210

A method of operating an olefin epoxidation facility in which a liquid **feedstream** containing olefin and an active oxygen species is continually fed through a serially connected cascade of at least 2 fixed bed reactors each containing a heterogeneous **catalyst**, comprises: (a) removing one of the fixed bed reactors from the cascade from conversion when the **catalyst** is deactivated by and undesirable amount; and (b) placing into service an additional fixed bed reactor containing a heterogeneous **catalyst** having a level of epoxidation activity higher than that of the **catalyst** taken out of service.

USE - The process is useful for epoxidation of 1-6C monoolefins, especially for conversion of propylene to propylene oxide (claimed), e.g. ethylene, propylene, n-butene, isobutylene, n-pentene and cyclohexene.

ADVANTAGE - The process provides at least 98% conversion of the organic hydroperoxide (claimed). The method allows an epoxidation facility to be kept in production on a continuous basis without interruption for **catalyst** change-over and will be more tolerant of upsets, low activity **catalyst** and bed blockage than prior art facilities containing a single reactor having a relatively large fixed bed of **catalyst**, which must be shut down periodically for **catalyst** replacement. Additionally, the **catalyst** consumption of the serially connected cascade will be less than the single large fixed bed for an equivalent total reactor volume.

Dwg.2/2

FS

CPI

FA

AB; GI; DCN

MC

CPI: E06-A02D; E07-A03A; J04-E04; N03-B01; N06-B01

L138 ANSWER 12 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1998-413159 [35] WPIX

CR 2000-430382 [37]

DNC C1998-124669

TI **Epoxidation** of **olefinic** compounds, e.g. propylene - by reaction with a hydroperoxide in the presence of a crystalline titano-stanno-silicate molecular sieve **catalyst**.

DC

E13

IN

LEWIS, G J; NEMETH, L T; ROSIN, R R; NEMETH, L

PA

(UNVO) UOP LLC; (UPOU-N) UPO LLC

CYC

31

PI

US 5780654 A 19980714 (199835)\* 7p C07D301-12

ZA 9806223 A 19990428 (199922)# 19p C07B000-00

EP 978315 A1 20000209 (200012)# EN B01J029-04

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT  
RO SE SI

AU 9876141 A 20000203 (200016)# C07D301-12

JP 2000026440 A 20000125 (200016)# 9p C07D301-12

CN 1241564 A 20000119 (200023)# C07D305-02

CA 2243009 A1 20000113 (200026)# EN B01J029-89

ADT

US 5780654 A US 1997-840531 19970422; ZA 9806223 A ZA 1998-6223 19980713;

EP 978315 A1 EP 1998-305563 19980713; AU 9876141 A AU 1998-76141 19980714;

JP 2000026440 A JP 1998-199271 19980714; CN 1241564 A CN 1998-103371

19980714; CA 2243009 A1 CA 1998-2243009 19980713

PRAI

US 1997-840531 19970422; ZA 1998-6223 19980713; EP 1998-305563

19980713; AU 1998-76141 19980714; JP 1998-199271 19980714; CN

1998-103371 19980714; CA 1998-2243009 19980713

IC ICM B01J029-04; B01J029-89; C07B000-00; C07D301-12; C07D305-02  
ICS B01J029-06; C01B033-20; C01B039-04; C07B041-00; C07D301-14;  
C07D301-19; C07D303-02; C07D303-04; C07D303-08; C07D303-38

ICA C07B041-04; C07B061-00

AB US 5780654 A UPAB: 20000807

An epoxidation process comprises reacting an olefinic compound in a **feedstock** with a hydroperoxide in the presence of a crystalline titanostannosilicalite molecular sieve of formula (I).

(TixSnySiz)O<sub>2</sub> (I)

$x = 0.0005-0.03$ ;  $y = 0.0001-0.01$ ; and  $x + y + z = 1$ . The tin and silicon atoms in (I) are present as framework tetrahedral oxide units.

USE - For the epoxidation of (cyclo)alkenes (e.g. propylene, 1-hexene and cyclohexene), allyl chloride, carboxylic acids, carboxylic anhydrides and carboxylate esters (e.g. maleic acid, fumaric acid and their esters) (claimed).

ADVANTAGE - Incorporation of titanium and tin into the silicalite structure provides increased activity and selectivity. The activity of the **catalyst** is unchanged after several hundred hours on stream and no leaching of tin or titanium is observed.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: E06-A02D; E06-A02E; E07-A03A; E07-A03B; N06-B02

L138 ANSWER 13 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1998-271144 [24] WPIX

DNC C1998-084543

TI **Olefin epoxidation** - comprises reacting an **olefin** compound with hydrogen peroxide in the presence of a titano-vanado-silicalite **catalyst**.

DC E13 J04

IN LEWIS, G J; NEMETH, L T; ROSIN, R R

PA (UNVO) UOP LLC

CYC 1

PI US 5744619 A 19980428 (199824)\* 7p C07D301-03

ADT US 5744619 A US 1997-818265 19970317

PRAI US 1997-818265 19970317

IC ICM C07D301-03

AB US 5744619 A UPAB: 19980617

A process for the epoxidation of a carbon-carbon double bond in an olefin compound (I) comprises reacting (I), contained in a **feedstock** with hydroperoxide in the presence of a **catalyst** (2). (2) consists of a crystalline titanovanadosilicalite molecular sieve composition, free of extraneous oxo-vanadium species. The titanium and silicon are present as a framework of tetrahedral units. The molecular sieve is of formula (xSiyTizV)O<sub>2</sub> (3).  $x = 0.96-0.995$ ;  $y = 0.005-0.0267$ ;  $z = 0.0004-0.01$ ; and  $x+y+z = 1$ .

ADVANTAGE - Olefins are converted to their epoxides in high yield and with great selectivity. The process is both facile and efficient. H<sub>2</sub>O<sub>2</sub> is readily utilised, even at low concentrations (2 wt.%), and reactions occur at a convenient rate at 25-75 deg. C.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: E06-A02D; E07-A03A; E07-A03B; J04-E04; N06-B02

L138 ANSWER 14 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1997-549028 [50] WPIX

CR 1995-081052 [11]; 1995-226153 [30]; 1998-041229 [04]; 2002-050509 [07]

DNC C1997-175058

TI **Epoxidation** of aliphatic mono **olefin(s)** - by contacting with hydrogen peroxide in the presence of a crystalline molecular sieve containing titanium.

DC A41 E13 H04 J04

IN CROCCO, G L; SAXTON, R J; ZAJACEK, J G

PA (ATLF) ARCO CHEM TECHNOLOGY LP

CYC 1

PI US 5684170 A 19971104 (199750)\* 8p C07D301-12

ADT US 5684170 A Div ex US 1993-172405 19931223, Cont of US 1996-622799 19960327, US 1996-650230 19960520

FDT US 5684170 A Div ex US 5374747

PRAI US 1993-172405 19931223; US 1996-622799 19960327; US 1996-650230 19960520

IC ICM C07D301-12

AB US 5684170 A UPAB: 20020130

Epoxidation of 2-10C aliphatic monoolefins comprises contacting the monoolefin with hydrogen peroxide in a liquid phase in the presence of a crystalline titanium-containing molecular sieve at 25-120 deg. C. The crystalline titanium-containing molecular sieve has a framework structure isomorphous to zeolite beta comprising Si and Ti but less than 1000 ppm framework aluminium, in a ratio of SiO<sub>2</sub>:yTiO<sub>2</sub> (y = 0.01-0.25). The sieve is prepared by: (a) contacting a zeolite beta with a mineral acid at 20-200 deg. C until all of the aluminium from the framework is extracted, to form a de-aluminised zeolite beta having a Si:Al molar ratio omega 750; and (b) contacting the de-aluminised zeolite beta with a volatile titanium compound at 100-850 deg. C.

USE - The process is useful for epoxidation of especially propylene (claimed) and, e.g. ethylene, butenes, butadiene, pentenes, isoprene, 1-hexene, 3-hexene, 1-heptene, 1-octene, diisobutylene, 1-nonene, 1-tetradecene, pentamycene, camphene, 1-undecene, 1-dodecene, 1-tridecene, 1-tetradecene, 1-pentadecene, 1-hexadecene, 1-heptadecene, 1-octadecene, 1-nonadecene, 1-eicosene, trimers and tetramers of propylene, styrene, polybutadiene, polyisoprene, cyclopentene, cyclohexene, cycloheptene, cyclooctene, cyclooctadiene, cyclododecene, cyclododecatriene, dicyclopentadiene, methylenecyclopropane, methylene cyclopentane, methylenecyclohexane, vinyl cyclohexane, vinyl cyclohexene, methallyl ketone, allyl chloride and bromide, acrylic acid, methacrylic acid, crotonic acid, vinyl acetic acid, crotyl chloride, methallyl chloride, dichlorobutenes, allyl alcohol, allyl carbonate, allyl acetate, alkyl acrylates and methacrylates, diallyl maleate, diallyl phthalate, unsaturated triglycerides (e.g. soybean oil) and unsaturated fatty acids, e.g. oleic acid, linolenic acid, linoleic acid, erucic acid palmitoleic acid and ricinoleic acid and glyceride esters. In addition, the titanium-containing molecular sieves are also useful as ion exchangers, shape-selective separation media or **catalysts** for other hydrocarbon conversion processes, e.g. **cracking**, selectoforming, hydrogenation, **dehydrogenation**, oligomerisation, alkylation, isomerisation, dehydration, hydroxylation of olefins or aromatics, alkane oxidation, reforming, disproportionation, methanation. The molecular sieves are also particularly useful for **catalysing** reactions previously **catalysed** by titanium silicalites (titanium silicates).

ADVANTAGE - Epoxide selectivities of, e.g. 75% and hydrogen peroxide conversions of 98% are obtained (in examples).

Dwg.0/1

FS CPI

FA AB; DCN

MC CPI: A01-E07; A02-A07; A05-A01A; A10-E06; E06-A02D; E07-A03A; E07-A03B; H04-E; H04-F02E; J04-E01; N06-B

L138 ANSWER 15 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1997-404580 [38] WPIX

DNC C1997-130554

TI Spent titanium-containing molecular sieve regeneration - comprises heating in an inert gas stream containing less than specified volume percentage of oxygen, particularly where sieve was **catalyst** from **olefin epoxidation** reaction.

DC E13 J04

IN CROCCO, G L; ZAJACEK, J G

PA (ATLF) ARCO CHEM TECHNOLOGY LP

CYC 9

PI EP 790075 A1 19970820 (199738)\* EN 5p B01J029-90

R: AT BE DE ES FR GB IT NL

US 5741749 A 19980421 (199823) 4p B01J020-34

EP 790075 B1 20011212 (200204) EN B01J029-90

R: AT BE DE ES FR GB IT NL

DE 69708947 E 20020124 (200215) B01J029-90

ES 2165563 T3 20020316 (200227) B01J029-90

ADT EP 790075 A1 EP 1997-300878 19970211; US 5741749 A US 1996-600661 19960213; EP 790075 B1 EP 1997-300878 19970211; DE 69708947 E DE 1997-608947 19970211, EP 1997-300878 19970211; ES 2165563 T3 EP 1997-300878 19970211

FDT DE 69708947 E Based on EP 790075; ES 2165563 T3 Based on EP 790075

PRAI US 1996-600661 19960213

REP DE 4425672; EP 604689; EP 631983; EP 659685; EP 743094

IC ICM B01J020-34; B01J029-90

ICS B01J029-04; B01J038-02; B01J038-06; B01J038-10; C07D301-12

AB EP 790075 A UPAB: 19970922

Spent, titanium-containing molecular sieve is regenerated by heating at 150-700 deg. C in a gas stream containing less than 5 volume % molecular oxygen until the activity of the sieve is increased.

Also claimed is the above method wherein the molecular sieve has an MFI, MEL or zeolite beta topology and has been used in an olefin epoxidation reaction, where regeneration comprises 1-150 hours at 250-600 deg. C in a gas stream containing less than 1 vol.% oxygen.

Preferably the regeneration is carried out in a static manner and the gas stream is flowed over the molecular sieve. Where the molecular sieve has been used in a fixed bed in the epoxidation reactor, the regeneration is performed in the **reactor**. The gas **stream** consists of inert gas(es) comprising nitrogen, helium, carbon dioxide, argon or water vapour; the molecular sieve is heated under anaerobic conditions. The composition of the spent sieve is  $x\text{TiO}_2 \cdot (1-x)\text{SiO}_2$ ; where  $x$  is 0.01-0.125.

ADVANTAGE - The gas stream contains less than 5 vol.% oxygen compared to the prior art which requires over 5%.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: E07-A03B; E31-P02B; J04-E05

L138 ANSWER 16 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1997-212525 [19] WPIX

DNC C1997-068550

TI Prepn. of 3,4-**epoxy**-1-butene from butadiene - comprises reacting **olefin** with oxygen contg. gas in presence of fluorine promoted silver **catalyst**.

DC E13

IN MONNIER, J R; OLTEAN, G L

PA (EACH) EASTMAN CHEM CO

CYC 19

PI WO 9710232 A1 19970320 (199719)\* EN 32p C07D301-10  
RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
W: JP  
EP 874837 A1 19981104 (199848) EN C07D301-10  
R: DE ES FR GB IT NL  
US 5908942 A 19990601 (199929) C07D301-10  
JP 2002510280 W 20020402 (200225) 30p C07D301-10  
ADT WO 9710232 A1 WO 1996-US14399 19960906; EP 874837 A1 EP 1996-930757  
19960906, WO 1996-US14399 19960906; US 5908942 A Provisional US 1995-3845P  
19950915, US 1996-703306 19960826; JP 2002510280 W WO 1996-US14399  
19960906, JP 1997-512016 19960906  
FDT EP 874837 A1 Based on WO 9710232; JP 2002510280 W Based on WO 9710232  
PRAI US 1996-703306 19960826; US 1995-3845P 19950915  
REP EP 243996; EP 244895; EP 369902; EP 425020; EP 59422; US 4897498; US  
4994588; US 5102848; WO 9011279; WO 9303024  
IC ICM C07D301-10  
ICS B01J027-12; C07D303-04  
ICA B01J023-50; B01J023-66; C07B061-00  
AB WO 9710232 A UPAB: 19990416  
Prepn. of a monoepoxide of norbornene, norbornadiene or an olefin of  
formula  $\text{CH}_2=\text{CR}_1\text{R}_2$  (I), comprises reacting the olefin with an oxygen-contg.  
gas in the presence of a supported, fluorine-promoted silver  
**catalyst** at epoxide-forming pressure and temp. The support has a  
surface area of less than 10 m<sup>2</sup>/g and carries on its surface of 0.1-50  
wt.% silver, 10-5000 ppm fluorine and a thallium, alkali metal or alkaline  
earth metal cation in the same wt. range as the fluorine.  
R1 = H or alkyl; R2 = aryl, tert. alkyl or  $-\text{C}(\text{R}_1)=\text{CH}_2$ , provided R1  
contains no allylic H.  
USE - The process is esp. useful for the prepn. of 3,4-epoxy-  
1-butene from butadiene (claimed).  
ADVANTAGE - The process reduces **catalyst** degradation,  
promotes thermal stability, provides increased selectivity and does not  
require extensive monitoring. It is resistant to thermal run-away and it  
is not necessary to rejuvenate fluorine by addition of further organic  
halide to the **reactor feed stream**.  
Dwg. 0/0  
FS CPI  
FA AB; DCN  
MC CPI: E06-A02D; E06-A03; E07-A03A

L138 ANSWER 17 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN  
AN 1997-118343 [11] WPIX  
DNC C1997-038198  
TI Prodn. of propylene oxide from hydrogen and carbon oxide(s) - by  
oxygenation and **olefin** conversion to propylene, **epoxidn**  
. with aq. hydrogen peroxide obtd. from hydrogen produced from  
**feedstream**.  
DC A41 E13 H04  
IN PUJADO, P R; VORA, B V  
PA (UNVO) UOP  
CYC 1  
PI US 5599955 A 19970204 (199711)\* 11p C07D301-14  
ADT US 5599955 A US 1996-605602 19960222  
PRAI US 1996-605602 19960222  
IC ICM C07D301-14  
ICS C07D301-16  
AB US 5599955 A UPAB: 19970313  
Prodn. of propylene oxide from **feedstream** comprising hydrogen  
and C oxides involves: (a) passing part of the **feedstream** to an  
oxygenate prodn. zone to produce an oxygenate which is passed to an olefin

prodn. zone contg. a metal aluminophosphate **catalyst** to produce a light hydrocarbon stream comprising propylene; (b) sepg. a crude propylene stream from the light hydrocarbon stream and passing it with an aq. hydrogen peroxide stream to an epoxidn. reaction zone contg. an epoxidn. **catalyst** to produce propylene oxide, light ends stream contg. unreacted propylene and spent water stream contg. heavy components; (c) sepg. at least part of the **feedstream** in a hydrogen sepn. zone to provide hydrogen stream comprising hydrogen and reacting in a peroxide prodn. zone the hydrogen stream and an oxygen-contg. stream to produce hydrogen peroxide and removing the hydrogen peroxide with water stream to produce the aq. hydrogen peroxide stream; and (d) treating the spent water stream to remove the heavy components and produce a treated water stream and recycling at least part of the treated water stream to provide the water stream.

USE - For prodn. of propylene oxide from **feedstream** esp. syngas, the propylene oxide being useful as chemical intermediate.

ADVANTAGE - Commercially efficient process which minimises or eliminates prodn. of low value waste streams and by-prods. Allows less complex and lower energy sepn. of propylene after prodn. of light olefins.  
Dwg.0/2

FS CPI

FA AB; DCN

MC CPI: A01-E07; E07-A03B; H04-E; H04-F02E; N01-D02

L138 ANSWER 18 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1997-020995 [02] WPIX

DNC C1997-006776

TI **Catalyst** contg. ruthenium and selenium - used for oxidation of hydrocarbon(s) to ketone(s), **epoxidation** of aliphatic and cyclic **olefin(s)**, ammoxidation, and **dehydrogenation** reactions.

DC A41 E19 J04

IN GELBARD, G; SCHARBERT, B; SCHULZ, R; VEDRINE, J

PA (FARH) HOECHST AG

CYC 20

PI WO 9637297 A1 19961128 (199702)\* DE 20p B01J027-057

RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE

W: CA JP US

DE 19519004 A1 19961128 (199702) 8p B01J031-34

ADT WO 9637297 A1 WO 1996-EP1961 19960509; DE 19519004 A1 DE 1995-19519004 19950524

PRAI DE 1995-19519004 19950524

REP DE 1543029; EP 475351

IC ICM B01J027-057; B01J031-34

ICS B01J027-13; B01J027-132; B01J027-138; B01J027-25; B01J031-30;

C01B019-00; C07B033-00; C07B035-04; C07C045-27; C07C051-16

AB WO 9637297 A UPAB: 19970108

**Catalyst** for gas phase oxidation of (un)saturated hydrocarbons or olefins consists of:- QaMbRucRdXeYfZgOh.H2Oi (where Q = Na, K, Rb, Cs, NR1R2R3R4+, Be, Mg, Ca, Sr, or Ba (where R1R2R3R4 = H, an 1-20C alkyl or 1-8C cycloalkyl residue, an aryl residue, esp. methyl, ethyl, propyl or butyl residue); M = V, Mo, Wo. R is from Sc, Y, La, Ce, Ti, Zr, Nb, Ta, V, Cr, Mn, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, or Cu; X = F, Cl, Br, j, NO3-, SO4 2-; Y = Ga, In, Ge, Sn, S, Se, Te, P, As, Sb, or Bi; Z = S or Se; a = 1-30; b = 5-50; c = 0.1-10; d = 0-10; e = 0-20; f = 0-10; g = 0.01-10; h = stoichiometric amount of oxygen atoms required for the oxide production; and i = 0-25). Prepn. of the **catalyst** is also claimed.

USE - The **catalyst** is used for the oxidation of (un)satd. hydrocarbons to ketones, acids, and aldehydes; epoxidation of aliphatic and cyclic olefins; ammoxidation of (un)satd. and aliphatic as well as

cyclic hydrocarbons and aromatics and alcohols; and oxidative **dehydrogenation** and dehydrodimerisation of alkanes, alkenes, and alkylaromatics.

ADVANTAGE - The oxidation can be selectivity carried out using molecular oxygen without producing unwanted bi-products.

Dwg.0/0

FS CPI

FA AB; DCN

MC CPI: A01-E07; E07-A03A; J04-E04; N01-A; N01-B; N02; N03; N05-D

L138 ANSWER 19 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1995-083397 [12] WPIX

DNC C1995-037492

TI Prepn. of tert.-butyl hydroperoxide contg. mixts. used as **feedstock** in **epoxidation** of **olefin** - by reducing water content, using simple non-hazardous distillation, of mixt. contg. tert.-butyl hydroperoxide, isobutane and water.

DC A17 A60 E13 E17

IN HAWTON, M J

PA (SHEL) SHELL INT RES MIJ BV; (SHEL) SHELL CANADA LTD

CYC 13

PI EP 639564 A1 19950222 (199512)\* EN 6p C07C409-04

R: BE DE ES FR GB IT NL

AU 9470353 A 19950302 (199516) C07C407-00

BR 9403288 A 19950411 (199521) C07C409-04

CA 2130306 A 19950220 (199521) C07C409-04

JP 07082247 A 19950328 (199521) 5p C07C409-04

AU 669639 B 19960613 (199631) C07C407-00

CN 1106796 A 19950816 (199731) C07C409-04

EP 639564 B1 19971029 (199748) EN 6p C07C409-04

R: BE DE ES FR GB IT NL

DE 69406510 E 19971204 (199803) C07C409-04

ES 2108366 T3 19971216 (199806) C07C409-04

SG 46384 A1 19980220 (199821) C07C409-04

ADT EP 639564 A1 EP 1994-202359 19940818; AU 9470353 A AU 1994-70353 19940818;

BR 9403288 A BR 1994-3288 19940819; CA 2130306 A CA 1994-2130306 19940817;

JP 07082247 A JP 1994-214328 19940817; AU 669639 B AU 1994-70353 19940818;

CN 1106796 A CN 1994-109102 19940819; EP 639564 B1 EP 1994-202359

19940818; DE 69406510 E DE 1994-606510 19940818, EP 1994-202359 19940818;

ES 2108366 T3 EP 1994-202359 19940818; SG 46384 A1 SG 1996-4004 19940818

FDT AU 669639 B Previous Publ. AU 9470353; DE 69406510 E Based on EP 639564;

ES 2108366 T3 Based on EP 639564

PRAI EP 1993-202448 19930819

REP EP 496624

IC ICM C07C409-04

ICS C07C407-00

AB EP 639564 A UPAB: 19950328

Prepn. of tert.-butylhydroperoxide (I) contg. mixts. which are suitable to be used as **feedstock** in olefin epoxidation comprises: (a) introducing a starting mixt. at least contg. (I), isobutane and water, into a distillation zone; and (b) selecting the conditions in the distillation zone such that an overhead stream contg. part of isobutane and a major part of water, and a bottom stream contg. the remaining part of isobutane and substantially all (I) are formed.

USE - (I) is used as **catalyst**, as initiator in free-radical type reactions and as intermediate in the prepn. of oxirane cpds. such as propene oxide.

ADVANTAGE - The water content of (I) contg. mixt. is reduced by a simple non-hazardous distillation.

Dwg.0/1

FS CPI  
FA AB; GI; DCN  
MC CPI: A01-E07; A02-A01; E10-A04B

L138 ANSWER 20 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN  
AN 1993-313421 [40] WPIX  
CR 1993-295283 [37]; 1993-377494 [47]; 1993-385700 [48]; 1994-056390 [07]  
DNC C1993-139232  
TI New hydroxyl functional derivs. of **epoxidised** diene block copolymers - prepd. by **epoxidising** precursor polymer contg. **olefinic** unsaturation then **catalysed** reaction of **epoxy** gps. with alcohol.  
DC A12 A81 A82 G02 G03  
IN BENING, R C; ERICKSON, J R; FLORES, J J; GIBLER, C J; ST, CLAIR D J; STARK, C J  
PA (SHEL) SHELL INT RES MIJ BV; (SHEL) SHELL CANADA LTD; (KRAT-N) KRATON POLYMERS RES BV; (SHEL) SHELL INT RES MIJ NV; (SHEL) SHELL OIL CO  
CYC 14  
PI EP 564049 A2 19931006 (199340)\* EN 29p C08F008-00  
R: BE DE ES FR GB IT NL  
BR 9301405 A 19931005 (199344) C08F297-04  
CA 2093192 A 19931004 (199401) C08F297-00  
JP 06025324 A 19940201 (199409) 26p C08F008-04  
US 5300586 A 19940405 (199413) 11p C08F008-00  
TW 222006 A 19940401 (199419) C08F236-04  
CN 1077459 A 19931020 (199428) C08F299-00  
US 5356969 A 19941018 (199441) 12p C08F008-30  
US 5356970 A 19941018 (199441) 12p C08F008-32  
US 5356974 A 19941018 (199441) 11p C08F008-00  
US 5356975 A 19941018 (199441) 11p C08F008-00  
EP 564049 A3 19940316 (199520) C08F008-00  
RU 2130032 C1 19990510 (200026) C08F008-00  
CN 1244542 A 20000216 (200027) C08F299-00  
EP 564049 B1 20011024 (200169) EN C08F008-00  
R: BE DE ES FR GB IT NL  
DE 69330977 E 20011129 (200202) C08F008-00  
ES 2164650 T3 20020301 (200229) C08F008-00  
JP 3285653 B2 20020527 (200241) 24p C08F008-04  
ADT EP 564049 A2 EP 1993-200947 19930402; BR 9301405 A BR 1993-1405 19930401; CA 2093192 A CA 1993-2093192 19930401; JP 06025324 A JP 1993-75594 19930401; US 5300586 A US 1992-863648 19920403; TW 222006 A TW 1993-101788 19930310; CN 1077459 A CN 1993-103654 19930401; US 5356969 A Div ex US 1992-863648 19920403, US 1994-217470 19940324; US 5356970 A Div ex US 1992-863648 19920403, US 1994-217397 19940324; US 5356974 A Div ex US 1992-863648 19920403, US 1994-217472 19940324; US 5356975 A Div ex US 1992-863648 19920403, US 1994-217517 19940324; EP 564049 A3 EP 1993-200947 19930402; RU 2130032 C1 RU 1993-4599 19930401; CN 1244542 A Div ex CN 1993-103654 19930401, CN 1999-108492 19930401; EP 564049 B1 EP 1993-200947 19930402; DE 69330977 E DE 1993-630977 19930402, EP 1993-200947 19930402; ES 2164650 T3 EP 1993-200947 19930402; JP 3285653 B2 JP 1993-75594 19930401  
FDT US 5356969 A Div ex US 5300586; US 5356970 A Div ex US 5300586; US 5356974 A Div ex US 5300586; US 5356975 A Div ex US 5300586; DE 69330977 E Based on EP 564049; ES 2164650 T3 Based on EP 564049; JP 3285653 B2 Previous Publ. JP 06025324  
PRAI US 1992-863580 19920403; US 1992-863648 19920403  
REP No-SR.Pub; EP 387947; US 3135716; US 4051199; US 5002676; WO 9008787  
IC ICM C08F008-00; C08F008-04; C08F008-30; C08F008-32; C08F236-04; C08F297-00; C08F297-04; C08F299-00  
ICS C08C019-40; C08F008-08; C08G059-50; C08J003-24; C08K005-16;



C08L053-02; C09D147-00; C09D153-00; C09D153-02; C09D163-08  
AB EP 564049 A UPAB: 20020701  
Making block polymers of conjugated dienes contg. hydroxyl gps. in the diene block comprises: (a) making a precursor polymer by polymerising a conjugated diene that leaves 1,2 disubstd.; 1,1 disubstd.; 1,1,2 trisubstd. or tetra-substd. olefinic unsaturation in the polymer; (b) epoxidising precursor such that the epoxy gps. form at the substd. sites and the amt. of epoxy functionality is 0.1 meq/g polymer or more; and (c) contacting the epoxidised polymer with an alcohol with an unprotected hydroxyl gp. and (an organic complex of) a cpd. of formula  $MX_n$  (I) (where M = H, B, Al, Fe or Sn; X = halogen; n = an integer equiv. to the valence of M).

Pref. step (c) takes place at 20-200 deg.C in a solvent, using a mol. ratio of **catalyst**:epoxy of 0.1-1:1 and diluting the **catalyst** to a concn. of 1 meq in 0.4-2.0 ml of solvent. The mol. ratio of alcohol:epoxy is 1:15-25 and the polymer concn. 10-20 wt.%. The epoxidised polymer may be contacted with an alcohol soln. contg. 0.01-1 g of HCl per g of polymer, using a mol. ratio of acid:epoxy of 5:1 or more, and at a temp. of 20-100 deg.C. The block copolymer may be hydrogenated after step (a) or (b) to leave less than 1 meq. of residual olefin per g of epoxidised polymer.

The **catalyst** is pref.  $BF_3$  diethyl etherate,  $BF_3$  t-butyl methyl etherate,  $BF_3$  dibutyl etherate, or  $BF_3$  dimethyl etherate. The alcohol has 1 unprotected OH gp. Any further OH gps. are protected as the acetal, ketal or carbonate. Pref. are n-butanol, solketal and trimethylolpropane ketal. The solvent in step (c) is pref. an aliphatic or aromatic hydrocarbon, a halogenated hydrocarbon or an acyclic ether, 1,3-butadiene or isoprene is pref. in a block polymer of formula (IV) or (V).

USE/ADVANTAGE - In coatings, sealants, many different kinds of adhesives and modified asphalts. The block copolymers can be crosslinked to provide enhanced physical properties. Functionalising the copolymers allows them to be hydrogenated to improve long term heat, weather and UV stability.

Dwg.0/0

Dwg.0/0

FS CPI

FA AB

MC CPI: A04-B01A; A04-B01D; A10-C02; A10-E06; A10-E08C; A10-E23; G02-A02D1

L138 ANSWER 21 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1993-088642 [11] WPIX

DNC C1993-039344

TI Alicyclic **epoxide** prepn. avoiding use of **peroxide** - comprises reacting aliphatic **olefin** with oxygen in presence of aliphatic satd. aldehyde and metal **catalyst**.

DC E13

PA (MITC) MITSUI PETROCHEM IND CO LTD

CYC 1

PI JP 05032647 A 19930209 (199311)\* 5p C07D301-06

ADT JP 05032647 A JP 1991-208906 19910726

PRAI JP 1991-208906 19910726

IC ICM C07D301-06

ICA B01J027-232; B01J031-12; C07B061-00; C07D303-40

AB JP 05032647 A UPAB: 19931122

Prepn. of alicyclic epoxide(s) of formula (I) comprises reacting aliphatic olefin(s) of formula (II) with  $O_2$  (III) in the presence of 2-6C aliphatic satd. aldehyde(s) (IV) and metal **catalyst** (V). In the formula, R1 and R2 = H or lower alkyl.

Pref. (II) (pref. R1 and R2=H or 1-4C alkyl) is reacted with 1-10(1-5)

mol-times (III) and (IV), (e.g. O2 air, etc in the persence of (V) esp. nickel acetoacetate, nickel carbonate 0.0001-10 (0.001-5)mol% to (II)) at 0-100 deg C for 1-50 (2-30) hr. The oxidn. is carried out in solvent e.g. (**halogenated**) **hydrocarbon(s)**, ester(s), nitrile(s) etc. in an amt of 5-50 wt-times to (II) pref. at a partial pressure of (IV) of 1-20 (pref. 1-1) atoms and alkaline earth metal carbonate(s) (opt. magnesium- or barium-carbonate, 1-5 equiv. times to (II)) may be added to the reaction system to improve yields of (I).

ADVANTAGE - (I) is easily obtd. from (II) without using dangerous **peroxide(s)** in high yield

Dwg.0/0

FS CPI  
FA AB; DCN  
MC CPI: E06-A02D; N02-C; N05-C

L138 ANSWER 22 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1991-313500 [43] WPIX

DNC C1991-135647

TI **Epoxy** resin compsns. for electronic element protective film - contain **epoxy** resins, poly allyl phenol and e.g. ethylene -alpha **olefin** copolymers.

DC A18 A21 A81 G02

PA (FUIT) FUJITSU LTD

CYC 1

PI JP 03207746 A 19910911 (199143)\*

ADT JP 03207746 A JP 1990-2702 19900110

PRAI JP 1990-2702 19900110

IC C08G059-40; C08L063-00

AB JP 03207746 A UPAB: 19930928

Compsns. contain 100 pts. wt. of (1) epoxy resins, 30-120 pts. wt. of (2) polyallylphenol (PAP) contg. structural units of formula (I) in molecule and 5-80 pts. wt. of (3) copolymers selected from ethylene/alpha-olefin copolymers, polystyrene/ polybutadiene/polystyrene end block copolymer, ethylene/propylene ternary copolymers.

Pref. (2) is polyallylphenol of formula (II). (1) are pref. epoxy resins contg. at least 2 epoxy gps. in one mole. The resin compsns. may contain inorganic fillers e.g. alumina in amts. of 30-85 wt.% of the compsn., curing **accelerators** in amts. of 0.2-10 pts. wt. to 100 pts. wt. of (1), couplers in amts. of 0.1-15 pts. wt., mould releases, colouring agents. The resin compsns. are obtd. by heating the components at 60-80 deg.C. in rolls, kneaders or extruders.

USE/ADVANTAGE - The epoxy resin compsns. are used for multilayered lamination, for the mfr.of electronic element-protective film, for prepn. of conductive paste, adhesive, paint and as moulding material and sealant. The resin compsns. have excellent heat resistance, flexibility, **crack** resistance, hydrophobic property.

In an example, a resin compsn. was prepd. by kneading 100 pts. (by wt.) of cresol novolak epoxy resin, 70 pts. of PAP of formula (III) and 5 pts. of ethylene/alpha-olefin copolymer at 60-80 deg.C. by a press. kneader. The compsn. was powdered. The 8 mesh pass powder was compression-moulded at 200 deg.C. under 80 kg/cm2. for 20 mins. The moulding was after-cured at 200 deg. C. for 8 hrs. The test piece had a glass transition pt. of 261 deg.C., bending strength of 7 kg/mm2. at 25 deg.C. and 5 kg/mm2 at 250 deg.C.

0/0

FS CPI  
FA AB  
MC CPI: A05-A01B; A07-A04A; A08-C07; A08-D; G02-A02D; G02-A02G; G02-A05B; G03-B02D; G03-B02E2

L138 ANSWER 23 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1987-330292 [47] WPIX

DNC C1987-140755

TI **Catalyst** for **epoxidation** of **olefin(s)** -  
comprises quat. ammonium salt or **peroxide**.

DC A41 B03 C02 E13

PA (SANP-N) SAN PETROCHEMICAL K

CYC 1

PI JP 62234550 A 19871014 (198747)\* 8p

ADT JP 62234550 A JP 1986-228768 19860927

PRAI JP 1985-296226 19851224; JP 1986-228768 19860927

IC B01J031-02; C07D301-12

AB JP 62234550 A UPAB: 19930922

**Catalyst** is salt or **peroxide** consisting of quat. ammonium ion derived from quat. ammonium cpd. or quat. ammonium cpd. with N-contg. ring and heteropolyacid ion of V gp. element of periodic table and W. Quat. cpd. has general formula of  $R_4N^{+}X^{-}$  (at least one R is alkyl gp. of 8-18C and other Rs are alkyl gps. or benzyl gps. of 1-18C. X = anionic counter ion).

Pref. N-contg. rings are pyridine ring, picoline ring, quinoline ring, imidazole ring and morpholine ring. Heteropolyacids are phosphonotungstic acid and arsenotungstic acid, etc. Solvents used are non-hydrophilic solvents, e.g. **halogenated hydrocarbons**

USE - The **catalyst** obtd. is used to react olefin and **H2O2** in a solvent at 0-120 deg.C. Cpds. obtd. by epoxidation are used as raw materials of epoxy resins and as intermediate prods. of reagents, medicines and agricultural chemicals, etc.

O/O

FS CPI

FA AB; DCN

MC CPI: A01-E07; B05-A03B; B05-B02A3; B05-B02B; B06-A03; B06-D02; B07-A03; B07-D04C; B07-D09; B07-E03; B10-A22; C05-A03B; C05-B02A3; C05-B02B; C06-A03; C06-D02; C07-A03; C07-D04C; C07-D09; C07-E03; C10-A22; E06-A03; E06-D02; E07-A03B; E07-D04C; E07-D09B; E07-E03; E10-A22A; E10-A22G; E31-K07; E31-L; N03-C; N03-H; N04-B; N05-D

L138 ANSWER 24 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1986-145208 [23] WPIX

DNN N1986-107519 DNC C1986-062070

TI **Epoxide** resin compsn. for encapsulating electronic components - contains adduct, prepd. in presence of an aluminium phenoxide **catalyst**, of a phenol with a conjugated di-**olefin** polymer.

DC A12 A21 A85 U11 V04 X12

IN AOYAMA, K; ENOMOTO, M; HARA, H; ORII, S

PA (NIOC) NIPPON OIL KK

CYC 3

PI DE 3541210 A 19860528 (198623)\* 14p

JP 61126162 A 19860613 (198630)

US 4639503 A 19870127 (198706)

JP 03041106 B 19910621 (199129)

ADT DE 3541210 A DE 1985-3541210 19851121; JP 61126162 A JP 1984-244364 19841121; US 4639503 A US 1985-798426 19851115; JP 03041106 B JP 1984-244634 19841121

PRAI JP 1984-244634 19841121

IC C08C019-00; C08G059-62; C08L009-00; C08L015-00; C08L063-00; H01B003-30; H01L023-30

AB DE 3541210 A UPAB: 19930922

Heat-hardenable compsn. comprises: (A) 100 pts. wt. hardenable epoxide

resin, (B) 30-300 pts. wt. adduct, prep'd. in presence of an Al phenoxide as **catalyst**, of a phenol with a polymer of no. average mol. wt. 300-10,000 which is a conjugated diolefin homopolymer or a conjugated diolefin copolymer contg. at least 50 mol.% conjugated diolefin monomer units. Opt. residual double bonds in the adduct are hydrogenated, the long term heat stability of the polymer being improved.

USE/ADVANTAGE - Encapsulating electronic components. Cured (I) has good mechanical and electrical properties, good resistance to water and improved resistance to **cracking**.

2,4-xyleneol (II) and Al platelets were stirred for 3 hrs. at 200 deg. C. The mixt. contg. the phenoxide was kept at 170 deg. C while 300 g polybutadiene (no. average mol. wt. 590, vinyl gp. content 51%) was added dropwise over 50 minutes. The mixt. was heated at 190 deg. C for 3 hrs. then the Al phenoxide was deactivated, the **catalyst** residue filtered off, and unreacted (II) removed by distn. under reduced pressure. The adduct contained 0.5 mol (II) monomer units added per 100 g polybutadiene; practically no (II) units added through ether bonds were present (13 C-NMR, OH content). Mixt. of 100 pts. Epikote 828 (RTM) as A), and 2-ethyl-4-methylimidazole was heated for 1hr. at 165 deg. C. The prod. had Tg 78 deg. C and withstood pressure cooker test (125 deg. C for 200 hrs.) and cyclic heat shock test (100 cycles of -40 to +120 deg. C, encapsulating a 12 (mm) dia. washer, JISC-2105).

O/O

FS CPI EPI

FA AB

MC CPI: A05-A01E2; A08-D; A10-E03; A12-E04; A12-E07

EPI: U11-A07; V04-S01; X12-E02B

L138 ANSWER 25 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1983-10457K [05] WPIX

DNN N1983-019797 DNC C1983-010238

TI Bonding polyolefin sheet to metal - using **epoxy** resin adhesive to bond sheet of ethylene -alpha-olefin copolymer prep'd. by use of organo-aluminium cpd.-contg. **catalyst**.

DC A17 A35 P73

PA (NIPE) NIPPON PETROCHEMICALS CO LTD

CYC 1

PI JP 57205139 A 19821216 (198305)\* 7p

JP 01040750 B 19890831 (198939)

ADT JP 57205139 A JP 1981-90836 19810615

PRAI JP 1981-90836 19810615

IC B32B015-08; C08F008-46; C08F255-02

AB JP 57205139 A UPAB: 19930925

Ethylene is vapour-phase copolymerised with a 3-12C alpha-olefin in presence of a solid **catalyst** contg. Mg and Ti and/or V and organic Al cpd. and in the absence of solvent to provide ethylene-alpha-olefin copolymer having a density of 0.890-0.960 g/cc and melt index of 0.1-10.0 g/10 min. The copolymer (100 pts.wt.) is modified with an unsatd. carboxylic acid or deriv. (0.01-10 pts.wt.). The modified copolymer is bonded with a metal using an intermediate epoxy resin adhesive.

The **catalyst** comprises typically MgO/RX/ TiCl4, Mg/SiCl4/ ROH/TiCl4 MgCl2/Al(OR)3/ TiCl4, MgCl2/SiCl4/ ROH/TiCl4, Mg(OOCR)2/ Al(OR)3/ TiCl4, Mg/POCl3/ TiCl4 or MgCl2/AlOCl/ TiCl4 where R is an organic residue and X is halogen. The organic Al cpd. is typically R3Al, R1AlX, RAlX2, R2AlOR, RAl(OR)X or R3Al2X3 wherein R is 1-20C alkyl, aryl or aralkyl and X is halogen.

Process provides waterproof, saline-proof adhesion having high resistance against environmental stress **cracking**.

FS CPI GMPI

FA AB

MC CPI: A02-A06B; A02-A07A; A04-F01; A04-G01A; A10-E03; A10-E23; A11-C01D;  
A12-A05C

L138 ANSWER 26 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1982-42236E [21] WPIX

TI Pure 1,2-alkane glycol prepn. - by **epoxidation** of alpha-**olefin** in organic solvent using organic acid and hydrolysis of prod. with tert alcohol.

DC E17

PA (NIPX) NIPPON PEROXIDE CO LTD

CYC 1

PI JP 57062234 A 19820415 (198221)\* 3p

JP 60041646 B 19850918 (198541)

ADT JP 57062234 A JP 1980-136767 19801002

PRAI JP 1980-136767 19801002

IC C07C029-10; C07C031-20; C07D301-12; C07D303-04

AB JP 57062234 A UPAB: 19930915

Prod. of high purely 1,2-alkaneglycol comprises epoxidising alphah-olefin of formula:  $C_2nH_4n$  (n is 6, 7, 8 or 9) in which the simple component is at least 95%, in water-insoluble organic solvent in the presence of organic acid and **hydrogen peroxide**, sepg. the produced alpha-olefin oxide and hydrolysing the alpha-olefin oxide in tert. alcohol and distilling and sepg. the prod. As the organic solvent, **halogenated hydrocarbon** such as dichloropropane, aromatic hydrocarbon such as toluene or xylene or petroleum ether is used and as the organic acid, formic acid or acetic acid is used. The solvent used in the hydrolysis is t-butanol. The epoxidation reaction is carried out at about 70 deg.C for 7-10 hrs. and the hydrolysis of alpha-olefin oxide is carried out in t-butanol in the presence of acid **catalyst** such as  $H_2SO_4$ ,  $HClO_4$  or  $HNO_3$  to produce 1,2-alkaneglycol in yield of at least 90%.

Highly pure 1,2-alkaneglycol useful as raw material of toilet goods and surfactants is produced cheaply by the simple process.

FS CPI

FA AB

MC CPI: E10-E04B; N04-A; N04-C; N04-D

L138 ANSWER 27 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1972-17554T [11] WPIX

CR 1970-16592R [10]

TI **Olefin epoxidation** - by molecular oxygen in presence of a **catalyst**.

DC E13

PA (INSF) INST FRANCAIS DU PETROLE

CYC 1

PI US 3641066 A (197211)\*

PRAI FR 1968-166397 19680916

IC C07D001-08; C07D001-12

AB US 3641066 A UPAB: 19930000

Epoxides are prepd. in the liquid phase by the direct oxidation of olefins with molecular oxygen in the presence of a **catalyst** at 20-250 degrees C under an oxygen partial pressure of 0.05-60 kg/cm<sup>2</sup>. The **catalyst** consists of zeolite carrier of pore diam. 6-10 angstroms on which is deposited 0.02-20 wt.% of Mo, W or V (or cpds. of these metals), and is used in an amt. 10-1 10<sup>-5</sup> g-atoms. of metal per kg of **feedstock**. Pref. olefin is polypropylene.

FS CPI

FA AB

MC CPI: E07-A03

L138 ANSWER 28 OF 28 WPIX COPYRIGHT 2003 THOMSON DERWENT on STN

AN 1970-21190R [13] WPIX

CR 1970-16592R [10]

TI Mo w or v supported on a zeolite **catalyst epoxidation**  
- of **olefins**.

DC E13 E31

PA (INSF) INST FRANCAIS DU PETROLE

CYC 1

PI DE 1945469 A (197013)\*

PRAI FR 1968-166397 19680916

IC C07D001-06

AB DE 1945469 A UPAB: 19930831

Epoxidation is agas liquid at 20-250 degrees C (68-180 degrees C) with partial pressure, 0.05-60 Kg/cm (0.05-20 Kg/cm) O2. The **catalyst** is the metal supported on a zeolite e.g. type X molecular sieve, with pore diameter 6-10 A Metal concentration is 0.02-20% wt. (0.5-12% wt) of **catalyst** are 10<sup>-1</sup> - 10<sup>-5</sup> g-atom/hg. of charge.

**Feedstock** preferably of formula R1R5CH-C(R4)=CR2 (where R1-R5 are alkyl, aryl, alkaryl, aralkyl or may form rings).

FS CPI

FA AB

MC CPI: E07-A03; E35-N; E35-Q